SPECIFIC DIAGNOSIS
AND
SPECIFIC MEDICATION

BY

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TOGETHER WITH
ABSTRACTS FROM THE WRITINGS OF JOHN M. SCUDDER, M.D. AND OTHER LEADING AUTHORS.

THE SCUDDER BROTHERS COMPANY
CINCINNATI, OHIO.
1909

TO THE MEMORY OF JOHN MILTON SCUDDER, M.D., THIS WORK IS DEDICATED BY THE AUTHOR.

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LANCET-CLINIC PRESS, CINCINNATI.
PREFACE.

WHEN the writer began to prepare the pages which follow it was his intention to revise and combine in one volume the two works of the late Professor Scudder on Specific Diagnosis and Specific Medication. The great advancement which has been made during the past third of a century in the Eclectic methods of practice, however, soon made it apparent that this would be to the writer an impossible task, for it was found that much new matter would have to be added in order to bring the work up to the present needs of the medical profession. This addition could not be made and still preserve Professor Scudder's unique arrangement and forcible diction. It was, therefore, thought the wiser and more satisfactory course to prepare a new work based on the writings of Dr. Scudder and more recent authors, including the personal observations of the writer. Individual credit has been given for much of the material used, but as it was found impossible to do so in all cases, a general acknowledgment of indebtedness to all modern Eclectic authors is hereby made.

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SAUGATUCK, CONN.
September 1, 1909.

INTRODUCTION.

IN THE early part of the nineteenth century a small body of the more advanced thinkers in the medical profession, through the influence and leadership of Dr. Wooster Beach, began to realize the extreme harshness-if not brutality-of the methods then employed in the treatment of the sick. They did not, however, seek to change the doctrine or principles upon which the old practice was based. They did not grasp the fact that the doctrine then universally accepted was wrong, for they themselves were firm believers in phlogosis and antiphlogistics. Blood-letting and large doses of mercury and antimony
they denounced—not because of their general depressant influence, but because they were thought to be
unmanageable, or that they exerted some special or permanent pernicious influence.

The efforts of these early reformers—the founders of the Eclectic school of medicine—were
mainly directed along the lines of substitution, and for many years this doctrine of substitution was
prominently brought forward in the lectures and writings of many of the leaders of the Eclectic school.
They labored to show that substitutes for the old means were numerous, and that while they were quite
as effectual at the time of need, their action was but transient, and, therefore, harmless.

The Eclectics of old had a number of substitutes for blood-letting, and some of the older men
spent much time in showing how the antiphlogistic influence of blood-letting could be secured, even to
the extent of syncope in active inflammation, by simply cording the limbs. This method was deemed a
great improvement in treatment, as the blood could be gradually let back from the corded limbs into
the general circulation, and thus the needed influence of blood-letting could be obtained in the relief of
active inflammation without loss of the vital fluid. Others believed that all the good effects of blood-
letting could be secured from the use of powerful cathartics; that in free catharsis the blood-vessels
could be depleted almost as quickly and to a greater extent, while the vital portions of the blood were
saved, and the serum would be quickly renewed. Still other prominent Eclectics thought that this
influence could be obtained by the kidneys as well as the bowels, and that the free action of both
kidneys and bowels would prove at least equal to blood-letting, and have the additional merit of
promoting the removal of a large quantity of effete material.

In those early days mercury was the all-powerful drug of the physicians who adhered to the
doctrine of the dominant school of medicine, as it was believed to remove disease through its action on
the liver. The Eclectics—then known as the reformed physicians—did not question the belief that it was
absolutely necessary to energetically influence the liver, or doubt that mercury exerted a powerful
control over the condition of that organ, but as with them mercury was the synonym for nearly all evil,
podophyllin was selected as a substitute for it in cases where a vigorous action on the liver was
believed to be demanded. In cases requiring but a mild influence leptandra was thought to be
preferable to podophyllin. The necessity for a substitute for mercury, however, was not doubted—the
liver had to be "tapped." But these remedies would not "touch the gums" as mercury would, and
"touching the gums" was still believed to be essential to the successful treatment of many diseases, so
an additional drug had to be combined with the mercury substitutes, and iris was selected to complete
the influences needed in order to get all of the therapeutic effects of mercury.

Vigorous counter-irritation was also believed to be a necessity, and many means were
employed to obtain it.

The blister was thought to be another necessity, and cantharides being the only certain agent,
or, at least, the only one that could be employed with safety, the Eclectics retained it. It would not do,
however, to go too far in adopting the methods of the old school, so they substituted for the tartar
emetic ointment a vegetable irritating plaster.

"Profound impressions" were still thought to be required in the treatment of many diseases, and
as these "impressions" must be made by means of active cathartics, gamboge, scammony, colocynth
and other similar drugs were frequently employed.

Nauseant expectorants were believed to be necessary in diseases of the respiratory organs, and
here again the plan of substitution is apparent, for they substituted for tartar emetic lobelia and
sanguinaria. They, however, retained ipecac.

Stimulant expectorants must be used, and as they had none better, they kept squills, senega and
tolu, and thus the doctrine of substitution ramified in every direction, and in some cases it was so slight
that there was no real difference.

These errors of substitution grew out of a want of a well-defined statement of principles, and
especially a want of knowledge on the part of some of the leaders of the new school. There was a
profound conviction that the old depressant practice was wholly wrong, and that in its stead treat-ment
should be restorative. So that, in fact, while substitution was thus freely discussed, and in many
instances sincerely believed in, entirely different means were employed.

The doctrine of substitution was the bane of the new school, and greatly impeded its growth,
but in time the leaders began to reject the antiphlogistic plan, and recognize the influence of Nature in
the cure of disease. The effect of this change in doctrine was soon seen in a more rapid growth of the
Eclectic movement. But it was not until a little more than a third of a century ago, when the late Prof.
John M. Scudder, M.D., brought the doctrine of Specific Diagnosis and Specific Medication
prominently before the medical profession, that it became a well-defined school of medicine, with independent and fixed principles of its own.

Ever since that time the Eclectic school has denied that a depressant treatment is needed in any case, and has been governed by principles which favor the conservation of vital power in all cases. They recognize specific medication, as advocated by Professor Scudder, to be the most rational method of prescribing, and it is now the distinguishing characteristic of the school. In other words, specific medication is modern Eclecticism.

Such prejudice against this system of therapeutics as may have existed has been due to the fact that it is often misunderstood. In order that there may be no need of misunderstanding by the reader, it is here stated that the Eclectics do not administer specific medicines for specific diseases as they are classified by the generally accepted nosology. They prescribe specific remedies for specific pathological conditions—that is, they divide diseases into their component parts, and prescribe for them in accordance with the symptoms-disease expressions-presented.

The words "Specific Diagnosis." are employed in this work as a means of designating a diagnosis of a specific pathological condition (not disease) which can be removed, or, at least, opposed, by a specific remedy or remedies. This, evidently, is what is needed to give us a rational practice of medicine, and it must, therefore, constitute the foundation of "specific medication."

The physician who practices specific medication should exercise great care in making a diagnosis. When called to a patient he should first carefully and correctly diagnose the case in accordance with the nosology now accepted by all scientific physicians. He should do this for the benefit of medical science, and also for his own personal benefit. A single mistake in this form of diagnosis may prove extremely detrimental to the reputation of the physician making it. Such diagnosis, however, should have but little influence in the treatment of the patient. This should be governed entirely by the symptoms or disease expressions. Before a prescription is made the case should be thoroughly examined as to its component parts. In this latter examination it has been found wise, in diseases liable to affect different parts of the body, to commence the examination by considering the symptoms-disease expressions-manifested in and about the head; then those affecting the throat, the lungs, the pleurae, the heart, the stomach, the liver, the spleen, the intestines, and so on downward to all parts liable to be involved.

Physicians who carefully examine their cases in this systematic manner soon acquire a habit of great thoughtfulness and keen observation, and seldom fail to quickly comprehend the true import of every disease expression in any given case coming under their care.

In this study of "Specific Diagnosis and Specific Medication" we wish to make therapeutics occupy the first place, and the diagnosis will mean remedies, whenever this is possible.

We do not care so much to affix a name by which the wrong may be known, as to prefix a remedy by the means of which the disease will disappear. In other words, the object of the examination is to determine what will remove the wrong of life and restore the patient to health. We can so study disease that its symptoms or expressions will clearly point to the needed remedial agent, or agents, and as this is the leading object of this work, we shall keep this fact constantly in view while considering the various wrongs of life.
SPECIFIC DIAGNOSIS AND SPECIFIC MEDICATION.

PART I. SPECIFIC DIAGNOSIS.

CHAPTER 1.

A BRIEF CONSIDERATION OF NORMAL LIFE.

LIFE is first manifested in the form of a single cell, composed of a mass of protoplasm. This mass of protoplasm contains a nucleus, and the simple substance we call a cell possesses a certain power which enables it to take to itself nourishment, and in this way obtain material for its sustenance and growth. It also possesses the power of reproducing its kind, and of exercising all independent action necessary to its elementary form of life, and incidental to its evolution from this elementary life to its position as a part of a higher and a more complex form of life.

Man's body is composed of cells and cell derivatives, arranged in such a manner as to act in harmony—the one cell aiding the other in its specific labor incidental to its position as a part of the organism we call man. These cells work in harmony by each taking from the surrounding medium that which is adapted to its individual development and functional activity, and rejecting or carrying to the neighboring cell that for which it has no need, and which is needed for the development, repair or functional activity of another of the community of cells contained in the part or parts of the human body.

In man cell function is largely controlled by the influence of the nervous systems. Still, the power of individual action by independent cells prevails, and each cell possesses the faculty of selecting that which is adapted to its individual use, without regard to the action of the other cells. Upon this selective faculty of individual cells must we ever largely depend for the beneficial results of drugs, as it is owing to this selective power that we are enabled to medicate certain portions of the body.

The life or health should be thoroughly studied, in order that we may be able to recognize every manifestation of this life by our senses.

We must bring our own senses to bear upon the living human being, and know how he feels, smells, looks and what sounds he makes. In other words, we must know him as a living human being. This study of the living man is the most important study in medicine.

There is but one way of making a good surgeon. He must exercise his senses on the human body. He must study the cadaver and learn the relation of the parts of the human body; and he must also study the living man and learn to recognize these relations by the sense of touch. The accomplished surgeon recognizes a displacement or fracture as soon as his eyes rest on the part. Let him pass his fingers over a limb in the dark, and he knows at once if anything is wrong, and just what the wrong is. He is a good surgeon just exactly as he is an expert in the knowledge which enables him to do this. The medical student should supplement his study of anatomy and physiology from books by a study of anatomy and physiology on the living man. He should observe him closely until he learns his varied expressions. He should carefully watch him walk, sit, lie, work, eat, breathe and talk. He should feel of him, see how he is made, and what he feels like in different parts.

He should learn every prominence of bone in the body and its relation to articulations, blood-vessels, nerves and organs. He should hear every sound he makes, and learn to recognize its character. In fact, he should learn everything concerning the living man, from the crown of his head to the soles of his feet, and learn to analyze him with his own senses. When he has accomplished this, he will have laid the foundation for a good physician.

Our senses should be so trained that we may be able to observe well. These faculties are like many others; they may be so trained under the influence of the will that after a time they work automatically, and with a rapidity that is astounding. All that one need do, to have good, active senses, is to use what he has rightly.

Man's conscious life is in and through his senses, and as these are educated and enlarged, his life becomes larger and his pleasures increased.

The study of anatomy is the basis of a sound medical education. One should not only be able to name the bones, processes, muscles and organs of the body, but he should also know them thoroughly. In order to become a skilled diagnostician a physician must be able to recognize at once the normal from the abnormal in size, shape and position of any part of the human body. This can be accomplished by a study of anatomy from the skeleton and by dissections, assisted by reading and lectures, but such study should be regarded as preliminary to a more important study. We must also
study anatomy from the living man, and this latter study should be thoroughly made. We want to know the situation and the relation of the various parts, so that we may be able to detect the slightest variation at once. We want the impress of the living man upon our senses, so that they may know him intimately. We want to know his every expression, standing, sitting, lying on his back, sides, etc. His expression in activity and at rest. We study his muscles in life, their arrangement on the bones, and their influence in giving the body motion. We study the situation of blood-vessels in the same manner, and learn to trace their course by the prominences of bone, relation to muscles, etc., and, going deeper, we study osteology again, as the bones are clothed in tissue.

There are two objects in studying anatomy in this manner, both important. The one is to know the mechanism of life, and the other is to educate the senses.

A thorough knowledge of physiology is also of the utmost importance, and that which can be learned from books must be acquired before one can become a good physician, but it is not sufficient for the purposes of the specific diagnostician. We not only wish to learn all that can be told by authors of works on physiology about certain phenomena which they have witnessed and learned to know as constant expressions of life, but we wish to know them ourselves, and through our own senses.

The body of a living man performs a great diversity of actions, some of which are quite obvious; others require more or less careful observation; and yet others can be detected only by the employment of the most delicate appliances of science. Thus, some part of the body of a living man is plainly always in motion; even in sleep, when the limbs, head and eyelids may be still, the incessant rise and fall of the chest continue to remind us that we are viewing slumber and not death.

"More careful observation, however, is needed to detect the motion of the heart; or the pulsation of the arteries; or the changes in the size of the pupil of the eye with varying light; or to ascertain that the air which is breathed out of the body is hotter and damper than the air which is taken in by breathing.

"And lastly, when we try to ascertain what happens in the eye when that organ is adjusted to different distances; or what in a nerve when it is excited; or of what materials flesh and blood are made; or in virtue of what mechanism it is that a sudden pain makes one start-we have to call into operation all the methods of inductive and deductive logic; all the resources of physics and chemistry; and all the delicacies of the art of experiment." (Huxley.)

The first lesson we learn from these brief but expressive paragraphs is, that we are to observe this man, who "is plainly always in motion," and that we are not to be satisfied with the observations of another. Then follows the natural sequence in these observations.

At first the gross expressions of the body, and the difference between the man awake, asleep, dead. Next a "more careful observation," determining the motion of the heart, etc. And lastly, the skilled observation, from a trained mind, aided by the various instrumentalities and appliances of science. Books are necessary in this study-they serve as guide-boards, pointing the way, and at the same time give us a standard of comparison. They tell us what to exercise our senses upon-what to observe-and they also tell us what others have observed, and what is the common standard of healthy activities. There is nothing in the life of man but should be a subject of close scrutiny. We want to know him in the entirety of his action, as we wish to know him in every detail.

And we want to know him so intimately and thoroughly, that this physiological man shall be always present with us as a standard of comparison.

The reader will at once see the necessity of this study as a basis for diagnosis. The physiological man is the man of health, the pathological man is one who has left this common standard of being. The physiological man is the standard of measurement, the common mean that we measure from. To have a measurement at all, it is necessary to have a fixed point to start from; this healthy man is the fixed point. Measurement has reference to certainty, and certainty is what we most desire in medicine.

The first thing that the physician wants, then, is a sound physiological standard, which he carries with him as he makes his rounds. It is lain by the side of the patient in bed, sits by him on the chair, stands by him, walks by him, puts out its tongue, extends its hand to give the pulse, has lungs, bowels, kidneys, reproductive apparatus, etc., always at your service, and open for comparison.

Disease is wrong life, and a wrong presupposes a right. To determine the existence of a wrong, we must know what the right is to determine the character of the wrong, we must compare it in all its parts with the standard set. This is diagnosis, as the reader can at once see.

How shall we get this physiological standard? Clearly, by observation with our own eyes and the use of our own senses. Each man must make it for himself, and give it distinctness by the education of his own senses. Theoretical knowledge will not do.

If we carefully observe the phenomena of sleep in the infant, child and adult, we cannot fail to
discover that the expressions of sleep are distinctive, and soon have a healthy standard by which to be guided. There are also distinctive expressions of the body in death that cannot be counterfeited. It is not only the absence of motion, of respiration, of pulse, or heart-beat, of heat, but there is an absence of the expression of life in its totality, and an expression of lifelessness that is characteristic. The relaxation of death is distinctive, as is the rigor mortis, and as is the decomposition of tissue.

It is well to have two points to measure from—the standard of life and the standard of death. There is an approximate death, as well as a total death; a dying by degree, or part, as well as a dying at once and in entirety. Taking a man in entirety, we find a distinct expression when he walks, stands, sits, or lies. Every part of the man talks to us, his hands, his arms, his legs and his feet. We not only learn from this much of the physical life of the outer man, but learn of the life within. The expression is the shadowing forth of the underlying nervous system. As physical and mental health has a distinct expression in the outer man, which we purpose using as a standard of admeasure; so all diseases, physical and mental, have a distinct expression in the outer man.

We have a standard of temperature which we readily measure with the thermometer. We have a standard electrical condition as an important factor of life, which we will learn to recognize in the general expression and movement, the special expression of the face and eyes, and by the touch. We also have a standard formative force, which we will recognize in the expression on tissues, and the sensations they give to touch.

We have a standard color for the general surface, and for special parts that the eye will learn to recognize, and use for comparison. We make this study thorough; it is the skin at large, and then those portions where the circulation is less free, where it is very superficial and free, the nails, hair, veins, etc. We have a standard color for mucous membranes, for lips, gums, tongue, etc.

We have a standard in touch—of smoothness, resistance, elasticity, size and association; and we have it of every part of the body. Of course, we cannot learn it from books. We must learn it by the use of our own hands and on the human body.

We have a standard respiration, in frequency, fullness, depth and freedom, which is distinct and clear, and which we know of ourselves by observation. We have a standard circulation, which we know at the radial artery, by the even, distinct, regular blood wave that passes under our finger, as well as by the expression of parts associated with the heart in action.

We have a standard condition of the digestive organs, which we learn from books and by observation. It does not take long to establish such a standard if we closely observe the general expression and the special expression of the muscles of the mouth. Blood-making and nutrition must have distinct expression, and a standard for measurement will be readily formed, for all functional activity is dependent upon nutrition. The standard of healthy excretion by skin, kidneys and bowels is readily formed by observation. Not observation on the sick, and under the influence of drugs, but upon the healthy human being.

The education briefly referred to in the foregoing is essential to good diagnosis, and its attainment, therefore, of the utmost importance to the practitioner of medicine. The normal senses of man are capable of great development, and in the next chapter brief suggestions will be given in regard to their cultivation.

CHAPTER II.
CULTIVATION OF THE SENSES.

The physician should give earnest and careful attention to the education of all his senses, especially to those of sight, hearing and touch. These senses should be so trained that they will not only do rapid and accurate work, but also act in harmonious association. A cultivated sense of sight alone is often capable of deciding the diagnosis in many diseases of the nervous system. An abnormal development of features and peculiarities of expression tell to the educated sense of sight a story which often makes for correct diagnosis.

The knowledge acquired from books and lectures is the foundation of a medical education, but it is insufficient for all the needs of the physician who wishes to make a success of his lifework. It must be supplemented by a thorough cultivation of the senses, and the brain must also be so educated that it will quickly receive impressions and make deductions.

Attention has been called to the proper study of anatomy, by which one may know the structure of the human body of himself; and the right study of physiology, by which one may know the various activities of this mechanism. To make these attainments requires continuous exercise of our senses upon the human body. The same course of study is necessary in order to obtain a thorough knowledge of disease. The descriptions given in works on the practice of medicine do not contain all the knowledge needed. We want to know disease for ourselves and it must be learned by the exercise of
our senses upon diseased bodies. If the senses, then, are the instruments by which we obtain knowledge, it will at once be patent to the reader that their development and goodness will be the measure of our ability and our attainments. Hence the man of educated and acute senses will be far superior to and have every advantage over the man who has not been thus trained and developed.

The law of development is always in operation in the human body, as it is throughout the animal and vegetable world. As any organ or part is rightly used, it grows in capacity. Not only in infancy, in childhood, up to adult years, but each and every year of a man's life to old age. It is more marked, of course, when the reproductive powers are active, but it is always a law of life.

There is another view of the question, and one which is quite as important to many persons. The law is not only operative in the one direction—to increase functional capacity—but quite as much so in the other direction—to lessen or take away that we have. The part or organ disused loses its functional capacity, becomes atrophied, and finally loses the power of reproduction—is wholly gone. The Indian fakir, who vows to hold his arms above his head, finds after years are passed, that they are no longer obedient to the will; their power is lost. This is the case with any part of the body—with the organs of special sense, and with the brain and functional activities.

It is the continued and orderly exercise of parts that gives them increased capacity. The organs of special sense have in them a mechanism for skilled use, as well as for the gross purposes of life, and it is this skilled use that we must call forth in diagnosis.

The senses of touch, of sight, of hearing and of smell are all useful in this study of diagnosis, and they all require training. The physician of unskilled touch, sight, hearing or smell can never make a skillful diagnostician. It is hardly necessary to give examples of this, as every physician's experience will show it a truism.

The unskilled touch could not recognize the variations of the pulse, or determine the condition of the skin, or do a great many things that might be done by the educated sense of touch. The untaught eye cannot distinguish the variations of form, size, color and other physical properties of bodies, which tell of condition and functional activity.

In medicine the ear requires education by use in order to detect some of the minute sounds, as the respiratory murmur, and a still further education to detect the minute shades of difference in sound, which tell of disease.

The uneducated sense of smell has no power of analysis, and the uneducated sense of taste is satisfied with the gross classification which divides all substances into pleasant and unpleasant. To the educated taste there is every gradation of the one and the other, and a power of great discrimination that is sometimes really wonderful in its acuteness. We cultivate the senses by continuously using them, and their education is the work of months and years. We can always find objects to exercise them upon, the training school is all about us, and we have only to make intelligent use of the facilities at our command. It is well, however, to have an intelligent plan, and follow it up assiduously, recollecting that "time, patience and perseverance will accomplish all things." The senses are intimately associated with the brain, and their education implies a mental training as well. Whilst we develop the organ of sense by use, we develop the brain upon which the impression is made, and the higher brain which takes cognizance of, and analyzes, the sensations. The development is thus a double one, and both are essentials in correct diagnosis. A plan presupposes thought, the act of the rational mind, as well as orderly activity.

The tactile sense has its highest development in the hands, and it is in this locality that it should be cultivated. Delicacy of touch is associated with normal condition of the skin, and necessitates much care of the hands. This means proper protection from cold, cleanliness and an avoidance of such work as thickens the epidermis, or gives it unnatural hardness. A plan of education suggests itself at once; the touch can be exercised upon every object we come in contact with.

Objects large and small, long and short, rough and smooth, of varied form, with inequalities of surface and of varied consistence, are readily found, and upon which the sense of touch can be exercised until they can be recognized as well in the dark as in the light. Take the bones of the skeleton and learn to recognize them by the touch as well as by the sight. Take the dead body and train the touch to recognize every part by its form and resistance. Take the living body and learn to recognize the impressions given by the skin, fasciae, muscles, bones, and by the cavities of the body.

In obstetrics a skilled touch is a necessity. Without it the various conditions and presentations cannot be recognized. The sense of touch is first trained by general use, and then we find opportunity upon the child already born, to acquire the knowledge of how a cranium, suture, fontanelle, nates, genitalia, shoulder, elbow, hand, knee, foot, feels—it is easy enough to find the opportunity, if one is inclined to learn, and it is easy enough to get this necessary skill in obstetric diagnosis if one is inclined.
to improve his opportunities.

The sense of sight is one of the most important in diagnosis, and it, like others, requires education, both as to the eye which receives and the brain upon which impressions are made. The eye receives impressions of color, and by education learns to detect the form, size, distance, and many of the physical properties of objects.

Color being one of the prominent characteristics of health and disease, the ability to accurately distinguish colors must be a great aid to the physician.

The uneducated eye receives the impress of color very much as it does light and shade, attaching about the same meaning to it, but when trained by use it readily detects slight variations.

A cabinet of colors is easily formed from natural objects which will greatly aid the student in his study of colors in detail. The vegetable and insect world furnish colors in great abundance, and specimens can be readily preserved. Quite soon the eye has learned to distinguish color from light and shade, and in a few weeks will become quite skilled, and yield much pleasure by the habit of observation thus acquired.

There is nothing trivial in nature, and nothing so poor or worthless that it should not be known; this is especially true to the physician because he must be a student of nature, to be able to deal with nature's greatest work, the human life.

The practical education of the eye to color is completed upon the human body. We find distinct varieties of color in health- of skin, of mucous membranes, of parts where the circulation is superficial, showing arterial blood, of veins, of the eye, the nails and the hair. We want to learn to know the healthy man by his color, and we may know him by this.

There is also abundant opportunity to educate the eye to the variations of color in disease, so that they will be readily recognized, and their true meaning known. The training the eye to the determining of size is not so important, yet will be found quite useful.

One physician will recognize a swelling, which evidences local disease, which another has failed to notice. So one will recognize a fullness of skin, of cellular tissue, of mucous membrane, of tongue, which another fails to see.

Training the eye to recognize form is very important, both to the physician and surgeon. The trained eye of the surgeon at once detects a deformity, and determines its cause, whether from fracture, dislocation, or structural disease. The trained eye of the physician should be able to recognize at once the general form of health, in the posture and expression of the patient, and the evidences of disease in the changes of form, in position, in sitting, lying, in the position of the limbs, and in the expression of the features. The trained eye recognizes changes in the form of the tongue, which express conditions of disease, and call for special remedies.

In diagnosis an educated sense of hearing is of very little less importance than an educated sense of sight. It requires close and continued study to hear the respiratory murmur distinctly, and this study must be continued if we expect to recognize the variations of this and the sounds produced in the bronchial tubes. Skill in physical diagnosis does not come by nature; it is the result of study, and the education of the ear and brain. No man can expect to succeed in it unless he is willing to give months to it, first to educate the ear to the hearing and analysis of sound, and next to the hearing and analysis of the sounds heard in the chest.

The sense of smell is of less importance, and yet it has its place in diagnosis. To some extent this sense is instinctive, especially as it warns against irritant substances and leads to their avoidance, but it is capable of being educated to a very high degree.

The sense of smell can be educated in the same manner as the other senses. We use it in the recognition of odorous objects, and pursuing the study we learn to discriminate between odors and recognize them immediately, as well as the character or conditions of the bodies they express. The educated sense of smell will recognize a want of bathing on the part of the patient, a want of ventilation, dirty clothes, dirty bedclothes, and all other unclean things in and about the sick-room.

It will point out conditions of disease, and recognize sepsis, loss of life and breaking down of tissue; and suggest for our consideration such remedies as echinacea, baptisia, chlorate of potassium,
sulphite of sodium, sulphurous acid, phenol, permanganate of potassium, boracic acid, and others of equal importance.

The sense of taste is an important one, and it should be well educated, but we cannot make much use of it in medicine. It is well, however, that we should be able to intelligently use it when-ever we have reasons to think that the food which our patients need is not being properly prepared.

There are some things that the physician will do well not to cultivate a taste for or in. He should not be a connoisseur in liquors. It is far better that the patient run the risk of getting bad whisky, brandy, or wine, than that his medical attendant should have acquired the ability to determine for him. If there is anyone road shorter than another to want of success, loss of character, poverty and wretched-ness, it is the habit of tippling. The road seems especially broad, smooth and direct to the doctor.

We have thus briefly referred to the education of the senses, and examined the means by which one is prepared for the practice of medicine. We regard this self-education of the senses as the basis of skilled diagnosis and therapeutics. All knowledge is available in medicine, and we fully appreciate the value of the present advanced course of medical study. The study of medicine and the collateral sciences should be carried as far as possible but unless the physical organism be thoroughly trained the usefulness of such knowledge will be greatly lessened.

CHAPTER III. DISEASE A METHOD OF LIFE.

A HUMAN being has but one body, and though it may be divided into parts, each has the same life, is supplied from the same blood, governed by the same nerves, and has the same nutrition and waste. Only in so far as drugs act on special part, or organs, need disease be studied independent of the organism at large.

A human being has but one life, and it is the same for all parts. The normal manifestations of this life are called health; the abnormal manifestations of it disease. If disease can always be thought of as a method of life, in a living body, a great error will have been gotten rid of, and a step will have been made toward a correct diagnosis, as well as toward rational therapeutics.

Disease is not an entity-something which can be expelled from a living body-but it is actually a method of life. The life of disease is an inferior form of life-not the pleasurable form of health, neither in the whole body nor in any individual part of it. It is always exhaustive, impairing the life now, and the life to follow by renewal of tissue. It makes no difference what may be the seeming condition of the body, or a part, in disease, the real condition is an impairment of life. The disease should, therefore, be studied as a method of living; and the diseased body treated as a living body, which has been placed in such position that its life has been enfeebled or deranged.

The structure and uses of the various parts of this one body must be clearly understood. We want to know clearly the conditions necessary to healthy life, and how their change that we call disease works. If we can understand clearly the relation of a condition or function of healthy life, we are in a position to learn how the change in condition or function produces disease, and a correct therapeutics is at once suggested. On examination of the human body it is found that certain conditions and functions underlie others, and seem to be first elements in the sum of life. Of these may be named temperature, circulation, innervation, nutrition and waste, and the blood.

These should always be studied first, for we want to know the exact character of the wrong, in one or all, and how that wrong can be corrected. In disease one or the other may stand first, and serve as a basis for wrong life in many directions. Thus, a disease involving every function of life may arise in a wrong of the temperature and circulation of the blood.

If the normal temperature and circulation can be restored by direct remedies having no depressing influence, the entire process of disease will disappear, or, at least, become so modified as to promptly yield to any necessary additional treatment.

Of course, it is not always easy to determine the wrong which stands first, yet with care it may be determined, and its determination is an essential in specific diagnosis. Disease has certain expressions, which we call symptoms, as health has certain expressions. The manifestations of life in health are very uniform and consistent. So in disease, the expression of morbid life is uniform and constant.

If, therefore, we determine in any given case the exact expression of diseased life, we will find it the same in all cases.

It is of great importance that we should become conversant with the exact character of a lesion, but it is of still greater importance that we should know the exact relation of drug action to disease expression, and how the one will oppose the other, and restore health. If an expression of disease can be pointed out which will be almost invariably met by one drug, and health restored as a result of its
action, one step has been made toward a rational practice of medicine.

If we have once determined such relationship, we have determined it in all diseases alike, in all persons, and for all time to come. If with this symptom or group of symptoms, aconite, nux or podophyllin cures to-day, it must be evident that it will cure all exactly similar cases in the future. The first lesson in pathology we want to learn is, that disease is wrong life. The first lesson in diagnosis is, that this wrong life finds a distinct and uniform expression in the outward manifestation of life, cognizable by our senses. The first lesson in therapeutics is that all remedies are uniform in their action; the condition being the same, the action of the remedy is always the same.

CHAPTER IV.
A CLASSIFICATION OF DISEASES.

The classification which follows is not presented with the expectation that it can take the place of the nosological classification usually found in works on the practice of medicine. It is believed, however, that it will prove of value to physicians who endeavor to treat pathological conditions in a rational manner. The object of classification is to notice the resemblances rather than the differences, to determine the pathological wrongs common to a series of diseases rather than to determine the special symptomatic differences. In discussing the usefulness of classifications of disease, an eminent writer remarks:

"It is obvious that any single character, or combination of characters, in respect of which diseases agree with or differ from each other, may be made the basis of methodical arrangement, under a larger or smaller number of divisions, or of higher or lower genera, or of classes, orders and genera. By ingenious devices of the mind the physician or the statistician may classify and arrange his knowledge so as to bring it all more readily within his reach for any special purpose—so as to make it, in fact, more at his disposal to facilitate and pave the way for further investigation. Such are the legitimate objects and the results of all methodical arrangements. Classification, therefore, being only a method of generalization, there are, of course, several classifications of disease which may be used with advantage for special purposes. The physician, the pathologist, the jurist, the hospital statistician, the army or navy medical officer, may each legitimately classify diseases from his own point of view, and for his own purposes, in the way that he thinks the best adapted to facilitate inquiries, and to yield him general results. The medical practitioner may found his main divisions of diseases on their treatment, as medical or surgical; the pathologist, on the nature of the morbid action or product; the anatomist or the physiologist, on the tissues and organs involved; the medical jurist on the suddenness, slowness, violent or unnatural mode of the death; the hospital statistician, on the kind of diseases which are treated in its wards; and all of these points of view may give useful and interesting results.

"There is thus no question on which more diversified opinions are legitimately entertained than on that of classification. Although it is the aim of all systematic writers and observers to arrange the objects of study in the most natural order possible, and although diseases are named as if they were individual entities, yet they present so great varieties that they will not admit of that definite and, in many respects, natural species of classification which can be made with objects of natural history. Manifest reasons of convenience and facility for work can therefore be assigned as the great incentive to classification; and numerous reasons exist for classifying diseases in various ways:

(1) Men differ in their estimation of the characters on which different arrangements may be founded; (2) the facts and phenomena of diseases on which classifications may be made are not all regarded from the same point of view. Most systems are avowedly artificial, being arranged with the view to elucidate or support a theory, or otherwise to effect a definite end. For example, by classifying diseases and recording the causes of death, the most valuable information is obtained relative to the health of the people, or of the unwholesomeness and pestilential agencies which surround them. 'We can take this or that disease,' says Dr. Farr, 'and measure not only its destructiveness, but its favorite times of visitation; we can identify its haunts and classify its victims.' We are able to trace diseases also as they perceptibly get weaker and weaker, or otherwise change their type, as some have done from time to time.

We know from the valuable returns, prepared periodically, that certain diseases are decreasing, or growing less and less destructive; that certain other diseases have ceased in some measure; while other severe diseases have exhibited a tendency to increase. The advantages, therefore, of adopting some system of classifying diseases, which can be put to such useful practical purposes, must be obvious to every one. "We want to learn the natural history of diseased life as we have learned the natural history
of healthy life, and a classification and nomenclature will aid us in acquiring this necessary knowledge.

The generally accepted nomenclature of disease is a necessity. It is absolutely necessary to be able to name a disease correctly according to the commonly received nosology. The name, however, should not have anything to do with the management of a case or the selection of remedies.

We will endeavor to simplify our classification, so as to make it a good guide for study, as well as suggestive of causes of diseases which may be avoided, of right attention to hygiene, and an outline of treatment.

The first division will have reference to causes of disease, as well as to pathological conditions. It will be into epidemic, contagious, endemic and sporadic diseases. The reader will notice that this is a natural classification, referring to causes of disease and their avoidance, and to a less extent to the conditions of disease and means of cure.

The second division will have reference to the general or local nature of the morbid states, and, as will be noticed, occupies the same ground as the preceding, this having reference to the conditions of diseases and not to its cause. All disease may be classified under these two 'heads, though many times it will only have reference to the primary lesion, for as the wrong goes on, a disease which was primarily general becomes localized, and one which was primarily local will cause general disease.

A third division has reference to the structure of parts or to their functional expression, and diseases are divided into structural and functional. Again, it will be seen that this classification of disease occupies the ground of both the first and second, for all disease must be structural or functional. Here, as before, we find it especially applicable to the primary disease, for one may have commenced as a functional wrong and grown into a structural disease, or a structural disease may have first existed, but this being cured, other functional lesions persist.

A fourth division might be called physiological, and would have reference to the functions of the body. If, for instance, we make the usual classification in teaching the principles of medicine:

<table>
<thead>
<tr>
<th>Formative</th>
<th>Heat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Force</td>
<td>Electricity</td>
</tr>
<tr>
<td></td>
<td>Formative-tissue making</td>
</tr>
<tr>
<td>Cells</td>
<td>Secreting—does the work of secretion</td>
</tr>
<tr>
<td></td>
<td>Necrological—pus cells</td>
</tr>
<tr>
<td>Digestion</td>
<td>Nutrition—Blood making</td>
</tr>
<tr>
<td></td>
<td>Tissue making</td>
</tr>
<tr>
<td>Secretion</td>
<td>Recrementitious</td>
</tr>
<tr>
<td>Arterial</td>
<td>Excrementitious</td>
</tr>
<tr>
<td>Circulation</td>
<td>Venous</td>
</tr>
<tr>
<td></td>
<td>Capillary</td>
</tr>
<tr>
<td>Brain</td>
<td>Innervation—Spinal cord</td>
</tr>
<tr>
<td></td>
<td>Sympathetic</td>
</tr>
</tbody>
</table>

Taking this classification, and assuming that there is a normal standard of health which may be known, and that disease is a departure from this standard, all lesions may be classified as being in excess, defect, or perversion. The classification which follows is taken from Williams' "Principles of Medicine":

### PRIMARY ELEMENTS OF DISEASE.

<table>
<thead>
<tr>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Secreting structure</td>
<td>Irritability</td>
<td>Tonicity</td>
</tr>
<tr>
<td>Tubulur (the conductor of nerve force)</td>
<td>Sensation</td>
<td>Sensation</td>
</tr>
<tr>
<td>Nervous structure Vesicular (the generator and combiner)</td>
<td>Voluntary motion</td>
<td>Excessive</td>
</tr>
<tr>
<td></td>
<td>Involuntary motion</td>
<td>- Hyperatrophy</td>
</tr>
<tr>
<td>Secretion structure</td>
<td>Red corpuscles</td>
<td>White corpuscles</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>----------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Elementary components of the blood</td>
<td>Albumin</td>
<td>Oil and combustive matters</td>
</tr>
<tr>
<td>Elementary</td>
<td>By respiration</td>
<td>By secretion</td>
</tr>
</tbody>
</table>

**PROXIMATE ELEMENTS OF DISEASE**

<table>
<thead>
<tr>
<th>The circulating blood</th>
<th>Deficient in quantity-Anemia</th>
<th>General</th>
<th>Partial</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Increased-Sthenic Asthenic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increased Determination of blood</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diminished-Congestion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Partly increased</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Partly diminished</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inflammation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nutrition of textures</th>
<th>Deficient-Atrophy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Excessive-Hypertrophy</td>
</tr>
<tr>
<td></td>
<td>Degenerations of tissues</td>
</tr>
<tr>
<td></td>
<td>Perverted Morbid deposits</td>
</tr>
<tr>
<td></td>
<td>Morbid growths</td>
</tr>
</tbody>
</table>

It will be seen that these various classifications point the way to certain necessary studies, having reference to causes of disease, their general expression and their influence on the functions of life.

Diseases are first divisible into *general* and *local*, and the first may be arranged according to an approved classification as follows:

- Tabes
- Chlorosis
- Scorbustus
- Dropsy
- General Disease-Dyscrasia
- Diabetes
- Rheumatism
- Pyemia
- Tuberculosis
- Carcinoma
Lesions induced by…Specific Agents
Vegetable Substances
Intermittent

Periodic…Remittent
Yellow
Febricula

Fevers Continued
Synocha
Typhoid
Thyphus

Eruptive
Variola

Contagious
Scarlatina
Rubeola
Spotted

Zymotic
Cerebro-spina Meningitis
Diphtheria
Erysipelas

Local disease are usually arranged in groups according to the function of parts. This seems to be the most natural arrangement, as the expression of disease is frequently wrong of function.

Of the brain
Spinal Cord Structural
Sympathetic Functional
Eye-sight
Ear-hearing

Of the Organs of Special Sense……Nose-smelling Structural
Mouth-taste Functional
Skin-touch
Nose
Pharynx
Larynx

Of the Respiratory Apparatus ………Trachea Structural
Bronchia Functional
Lungs

Of the Circulatory Apparatus………Capillaries Structural
Veins Functional
Lymphatic Vessels
Lymphatic Glands
Mouth
Salivary Glands
Tonsils
Pharynx
Esophagus

Of the Digestive Apparatus………..Stomach Structural
Small intestine
Large intestine
Liver
Spleen
Pancreas
Peritoneum
Suprarenal Capsules
Kidneys

Of the Urinary Apparatus…………..Ureters
Bladder
Urethra
Scrotum
We will make a study of disease according to four general divisions: (1) With reference to the cause-epidemic, contagious, endemic, sporadic; (2) as it is general or local; (3) as it is structural or functional; and (4) as it shows a departure from the physiological standard.

**Epidemics.**

Many physicians have recognized the fact that the conditions of life change from time to time, and that as the result of this there are variations in the wrongs of life-diseases’ and in their expression. That in some years and seasons, these changes were so great as to give that character to disease which is usually known as epidemic. The fact has been recognized that this epidemic condition might influence but one disease, or a class of diseases, as those called contagious, those called zymotic, or it might influence all diseases or pathological states.

The general epidemic influence is known by some special character of disease, which is widespread, and is noticed in many localities. In some cases it will be seen as a condition of asthenia, in others of undue excitation. In some it partakes of the zymotic character, and this influence upon the blood is noticed in a majority of cases of acute disease. Physicians will recollect it under the name of typhoid, giving a peculiar character to fevers and inflammations, and even noticed in minor affections.

This epidemic influence is frequently marked by special symptoms calling for special remedies. The reader will have no doubt observed that the diseases of some seasons, no matter how diverse in special characteristics, would have something in common, which something would be especially manifest in the treatment, so that when you had once determined a good treatment, you would persist in it for nearly all affections, with very little modification.

This brings prominently before us the fact, for fact it is, that there is an endemic or epidemic constitution of disease, that should be well studied, and always regarded in treatment. Success or failure will very frequently depend upon this knowledge. If this theory of epidemics is borne out by future observation, it must have an important bearing upon therapeutics. If we determine a common element in the diseases of a season, we will have something common in the remedies.

If we have an underlying influence of this kind, giving character to disease throughout a considerable extent of country, it is an influence that should be known, and have due weight in our estimate of pathological processes. If we can go still further, and find certain epidemic remedies opposed to this influence, whatever it may be, it will greatly aid our treatment.

We find years in which the peculiar wrongs known as typhoid are prominent. All acute diseases seem to partake of this character, and if of considerable duration, typhoid symptoms will be developed. Pneumonia, dysentery, intermittents and remittents run into typhoid, as well as other diseases. This epidemic influence is readily recognized, and suggests treatment. Zymotic diseases are not un frequently epidemic, or have underlying them the epidemic character. It is true they frequently
produce a specific contagion, which serves as a cause of their propagation, and this we wish to keep distinct from the character we are now studying. The epidemic influence is that which renders the community very susceptible to the contagious poison, or gives it specific characters, or renders it more destructive to life.

Readers will readily recall epidemics of this character-seasons in which smallpox, scarlet fever, measles or whooping-cough were remarkably prevalent, easily transmitted, difficult to protect against, possessed distinctive features, and required special treatment. They will likewise recall the fact that in these years other diseases would show similar peculiarities, and would require similar remedies. This will have been noticed in local complications, as well as in the general features. That in some years there was a remarkable tendency to disease of the respiratory apparatus, or of the bowels, or of the kidneys, or of the nerve centers, and that these local affections were to be met with as complications of all diseases.

We are acquainted with quite a number of epidemic remedies, and find the list continuously enlarging. So marked is the influence, and so distinct the features, that we sometimes find a single remedy sufficient for the entirety of disease. It is possible that we may make the best study of remedies in such seasons, for it has been noticed that if a remedy has thus proved markedly curative at such times, the epidemic symptoms indicating it being pronounced, the remedy would prove curative in sporadic, endemic, or contagious diseases, wherever the special symptoms were present.

The remedies worthy of special notice in this connection are quinine, hydrochloric acid, sulphurous acid, sulphite of sodium, chlorate of potassium. echinacea. baptisia, aconite. ferrum phosphoricum, veratum, gelsemium, rhus toxicodendron, tincture of the muriate of iron, nitric acid, belladonna, bryonia, nux vomica. etc. All of these may be advantageously studied in this connection.

**Contagious Diseases.**

Certain diseases are produced by a specific cause and propagated from person to person. In them we find that the contagious element is continuously reproduced in kind, and the expressions of disease are alike.

It may and often does vary from epidemic influences, and from endemic influences, but in general features there will be a remarkable likeness, and in therapeutics there will be something in common.

The diseases grouped under this head are the eruptive fevers, whooping-cough, erysipelas, puerperal fever, diphtheria, cerebro-spinal meningitis, cholera, typhoid, typhus and yellow fevers, inflammation with typhoid symptoms, and some other fevers and inflammations. These diseases have certain distinct expressions which are fully given in works on practice. Attention is here called to these expressions for the purpose of using them as specific indications for remedies.

They suggest agents that destroy the material of contagion, great cleanliness, and a sustaining treatment. The prominent symptoms seen in measles suggest bryonia and ferrum phosphoricum. The first few doses may be given in very hot milk. Asclepias may constitute a part of the treatment if needed to favor determination of the eruption upon the skin and relieve irritation of mucous membranes. Drosera is the specific remedy for the cough. In some cases, marked indications for magnesia phosphoricum will be seen.

In scarlatina, belladonna is always an indicated remedy, and in many cases much needed as a stimulant to the capillary circulation of the skin. It may be combined with aconite or ferrum phosphoricum. as indicated by the symptoms. Fatty inunction may be employed to allay itching and favor desquamation. If other children live in a house in which scarlet fever occurs, minute doses of belladonna as a prophylactic should be administered to them. In whooping-cough the symptoms suggest magnesia phosphoricum. drosera. belladonna. nitric acid and trifolium pratense, to be employed in accordance with the special indications presented in each case.

**Zymotic Diseases.**

All contagious diseases may be classed as zymotic, but all zymotic diseases are not contagious. Erysipelas, diphtheria and cerebro-spinal meningitis may be epidemic, endemic or conta-gious, and they should be studied in each of these classes. they prove contagious it may be from either one of two conditions-the intensity of the diseased action, or the loss of life and breaking down of the tissue.

In studying erysipelas we find that it sometimes develops remarkable virulence in this direction, so much so that it will attack almost every surgical case in a hospital, and will be contracted by nurses and others. This, of course, will be noticed especially in certain years (epidemic influence)
and in certain localities (endemic influence), but we cannot neglect to notice the contagious element.

In the one case we notice the intensity of disease, both as to its local and general symptoms. The part is intensely hot, burning, painful, and is dry and tense, and its color, whether bright or dark, is vivid.

The pulse is frequent, tense, and unyielding, the temperature has a high range, and the nervous system shows great excitation. Whenever such symptoms show themselves, we may fear contagion, and will employ means to prevent the infection of others.

In the second case we have the evidences of sepsis and deliquescence of tissue. Locally the part is full, and wants elasticity, the epidermis yields, and presently the connective tissue. The discharge becomes offensive, the pulse oppressed and feeble, and the tissues at large softened.

In the first class of cases remedies should have reference to the intensity of the diseased action, and consist principally of veratrum, rhus, apis, belladonna and tincture of the muriate of iron. In the second, echinacea and other proper antiseptics, with restoratives, will be needed. In puerperal fever the same two elements of contagion are quite as marked as in erysipelas. But there is added a third, an infectious material thrown off from the reproductive organs. So marked and virulent is this, that it is readily communicated by the physician from patient to patient, even through an interval of days or weeks. It is not only thus infectious, but is intensely poisonous to the patient, and its re-absorption intensifies disease, and frequently leads to a fatal result.

In these cases the physician should give special attention to preventing the spread of contagion. In some cases this may be accomplished by strict attention to cleanliness, change of clothing and the use of antiseptics. To prevent re-absorption great cleanliness and such antiseptics as bichloride of mercury, chlorate of potassium, sulphite of sodium and dilute sulphurous acid should be employed.

In diphtheria the contagions property seems to be developed more by the intensity of the disease than by devitalilization of tissue and putrescence. and it is always well to use extra precautions when the febrile action and local inflammation are intense. But here as in puerperal fever a specific infection is generated at the point of local disease, and is readily communicable to others.

This is so marked that the diphtheritic deposit is readily inoculable, not only in the throat, but on almost every abraded surface.

The knowledge of these facts will not only came us to guard against the general conditions of contagion, as in the other cases, but especially against the transmission of the local infection by coming in immediate contact with the patient and inhaling the breath, the use of towel, handkerchiefs before they have been thoroughly purified by boiling, and especially the use of probangs, swabs, or surgical instruments that have been employed on a diphtheritic patient.

A treatment based upon the specific indications for remedies has given the most satisfactory results in diphtheria. Aconite, phytolacca, Echinacea, and bichromate of potassium are the remedies most frequently indicated. The antitoxin treatment is approved by the larger part of the medical profession and in many cases has proved of great value. Lobelia hypodermically employed has also given good results in many severe cases.

In cerebro-spinal meningitis we have a double element of contagion-the generation of the infectious material by the intensity of the disease and by loss of life in tissues and putrescence. All possible means should be employed, both to prevent the spread of and to protect the patient against the poison generated in his own body.

Asiatic cholera might he studied in the class of epidemic diseases, as in the seasons of its prevalence there is a marked epidemic influence, that shows itself in other diseases as well as this. But though we recognize this, the evidence that it is propagated by a specific contagion is too well proven to allow us to neglect it. Cholera advances on lines of travel, and renews its strength as it goes, going with people, being propagated by and in people. Gaining strength and virulence by special combination of circumstances in its native country, India, it takes passage by steamship to Europe, from Europe to America, where it is distributed by railroad, steamboat and every other means of transit.

It is probable that the infectious poison is found principally in the excretions, and mainly in the dejections from the bowels, and the disease is especially propagated from them. If so, it points the physician to the necessity of especial care in the removal of the dejections, and that they be so disposed of as not to endanger others, either by their exhalations. or by contaminating the water supply.

The diagnosis of cholera is made by the great exhaustion which accompanies the first discharges, the evidence of imperfect circulation and aeration of the blood, as seen in the bluish
discoloration of the extremities, want of color in the feces, marked enfeeblement of the circulation and lowered temperature; and by the excessive thirst, nausea and vomiting and muscular cramps.

Typhoid fever and acute diseases assuming typhoid symptoms, usually possess the contagious element in slight degree. Yet in some cases we observe a remarkable development of this character which demands the attention of the physician. Typhoid is generally thought to mean asthenia, but it is better to think of it as having reference to sepsis of the blood. With the condition of sepsis, comes the property of contagion, and under some circumstances this becomes marked. Diseases called typhoid will usually be found to develop the character of contagion both from intensity of disease and from impairment of the life of tissue and putrescence.

The most marked cases are those in which there is great nervous excitation, tense tissues, high temperature, and the sensations of pungent heat when the hand is applied to the surface. The other cases are distinguished by a peculiar sweetish, cadaveric odor of breath, dark fetid feces, and fetor of urine.

Typhus fever is markedly contagious, and may be wholly propagated by a specific contagion generated during the progress of the disease, and thrown off in the excretions from the bowels, kidneys, skin and lungs. It has been noticed that here intensity of disease, marked by great febrile excitement, was more likely to develop the contagions dement than the condition commonly known as putrescence.

Yellow fever is undoubtedly contagious in degree, sometimes very markedly, and at others so as to exert but little influence. Both conditions of contagion have been noticed; that from great intensity of disease and from putrescency appearing in the last stage with the black vomit.

**Endemic Diseases.**

The cause of endemic diseases is evidently a local one, and in many cases it may be discovered and removed or avoided.

These diseases have a definite and distinctive expression, which should and may suggest the means of cure. In some the endemic influence is so wholly the cause, and the endemic expression so clearly indicates the lesion, that remedies will be remarkable for their curative influence. At other times the endemic influence, and diseases produced, will be but a part of the wrong, and whilst the endemic remedies are important, they are not so certain as before, and have to be aided by other means.

The diagnosis of endemic disease is usually very easily made, as there is something distinct and special in the expression of disease, and there are a number of cases showing these special features. They are also restricted to definite localities.

First among the diseases included in this classification are all those showing periodicity, including intermittent, remittent, and yellow fevers. Following these, we find that an endemic influence may give rise to the series of continued fevers, to all inflammations, and to many functional and structural diseases. And it is to be noticed that, as a rule, the endemic influence intensifies the natural disease in addition to giving it special features.

Whatever may be the cause of periodicity in disease, the fact is sufficiently tangible, easily recognized by the periodic expression, which indicates a special pathological condition, and calls for a special group of remedies, antiperiodics-quinine and other drugs of similar action. As before remarked, the periodic element may serve as a basis of nearly every named disease, which will be cured by one remedy, quinine. Or it may only be a complication or part of the disease, and quinine will only be one of the remedies called for. nut periodicity does not always mean quinine, and it is sometimes difficult to determine whether it docs or not. All diseases are periodic to a certain extent, having periods of increase and diminution, as may be noticed even in the fevers called continued. Indeed, all the functions of life, both in health and disease, have something of periodicity in their performance.

The diagnosis of periodicity is usually made clear by the marked remission or intermission of the evidences of disease, and a partial or complete return to the healthy standard of life; the equally marked exacerbation of disease, especially with reference to the wrongs of innervation, temperature and circulation; the disposition to continue such functional aberrations without change of structure and the fact that such disease is endemic in the locality.

Intermittent fever is made apparent by a marked cold stage, followed by a hot stage and a sweating stage—all occupying— a comparatively short time. Usually less than twenty-four hours; and then a more or less complete intermission of the disease and return of normal functional activity.

If the intermission is complete, with normal temperature, normal circulation, innervation and
secretion. quinine will be the remedy. If functional wrongs should persist during the intermission, appropriate means should be employed for their removal, and the quinine given if the disease persists.

Remittent fever is made clear when there is a forming stage of more or less duration, and which is frequently attended by gastric disturbance and frontal pain; a chill, not nearly so intense as in intermittent fever, but well marked, and a hot stage which is distinctly broken up into remissions and exacerbations, and continues to the sweating stage which is the termination of the disease.

The distinct remissions and exacerbations-periodicity- means quinine. and in some cases this remedy will be sufficient to arrest the entire series of morbid processes. This condition will be known by the soft and open pulse, the moist and cleaning tongue, the soft and moist skin. and a return of normal innervation at the remissions. If these conditions do not appear, the character of the wrongs must be determined and the means necessary to remove them employed.

Yellow fever cannot prevail in unfavorable situations (it is said never to prevail at altitudes of more than four hundred feet above the ocean), and just in proportion as the local influences favor it, the disease will be severe and fatal. Bad drainage and want of cleanliness are especially noted as likely to favor the propagation of yellow fever.

The diagnosis of yellow fever is made by the marked chill attended by lumbar and frontal pain, nausea and vomiting; the rapid accession of the hot stage, which is very intense, lasting from twenty-four to seventy-two hours; the abatement of febrile action, but with marked prostration, and gradually increasing yellowness of skin; and the return of nausea and vomiting-the black vomit.

Next to periodicity, the most frequent and marked endemic influence is that which gives the typhoid character to fever. It may produce typhoid fever with disease of Peyer's glands, may cause typhoid symptoms in remittent fever, and all the inflammations. A very common manifestation of the influence is in dysentery and pneumonia. The local cause is evidently decomposition of vegetable and animal matter, the products being thrown off into the air and inhaled, absorbed by food, or infecting the water supply. As it is possible to remove such causes, the physician should always direct attention to them in these cases, that they may be removed.

Using the word typhoid as an adjective to designate a condition of disease, it has reference to the condition of sepsis and putrefaction. The enfeeblement or asthenia is but an incident and is sometimes not noticed until a late stage, though the typhoid symptoms are marked.

The diagnosis is best made by examining the exudations or secretions. It is especially marked in the mouth; on the tongue by dirty coating, or a fur that assumes a brownish tinge and gradually becomes deeper until it is almost black; dirty or dark sordes upon the teeth; unpleasant, dark and offensive feces; urine that is frothy, and gives an unpleasant cadaveric odor. We also notice it in the sense of pungent heat when the hand is applied to the surface, and in the low delirium. In surgical diseases, the discharge from wounds or injuries, or operations, will show it, in a wrong of the pus, which becomes thin, ichorous, fetid, and in a tendency to softening of tissues and sloughing.

This condition suggests the use of remedies known as antiseptic, especially echinacea, sulphite of sodium, sulphurous acid, chlorate of potassium, hydrochloric acid and baptisia, to be selected according to their specific indications. We also find special expression; of disease, when endemic, that indicate special remedies, and these prove curative. As in the case of epidemic influence, we find that these symptoms are common to many or nearly all diseases of the season or year, and the remedy indicated assumes a very prominent place in treatment.

Thus all the remedies named as being indicated in epidemics, are found indicated when the cause is endemic. Thus we sometimes find all erysipelas, puerperal fever, or dysentery, that is clearly endemic and the special indications for remedies will be distinct. We want iron, veratrum, rhus, podophyllin, etc., and the indications and so direct and positive that a cure is certain and speedy.

**Sporadic Disease.**

In this last class we find no special expression of disease or, in other words, we find the regular succession of symptoms as given by authorities. The causes are in the acts or indiscretions of the individual in exposure to heat, cold, wet; want of proper clothing or protection; intemperance in eating and drinking; over exertion, physical or mental-and the reverse, a want of exercise.

Or the cause may be found in the general conditions of life; sudden changes of temperature; more or less moisture in the atmosphere; and a greater or less electrical condition.

These causes are temporary and avoidable, and it is well to study them ill relation to disease. Whilst a man may not escape an epidemic. Contagions, or endemic cause, right living will usually prevent the class of diseases called sporadic. It is also well to notice that these diseases are usually simple in their structure and very amenable to remedies. If we determine which is the first wrong of function, and right it, we will have but little trouble in treatment. If sporadic fever yields readily to the
special sedatives-agents that rectify the wrongs of the circulation; or at farthest will need but the help of those which increase secretion. An inflammation readily yields to the general sedatives, and those which remove the irritation of the part. The important points to determine if these cases are the character of the general disease, and the remedies which will fight it; the situation and character of the local disease, and the remedies that will influence the part, and influence it in a right direction.

**General and Local Disease.**

This would seem to be a very simple and profitable classification, both in determining the character and gravity of disease, and in selecting remedies. Yet when we come to the bedside we find it very difficult to make the diagnosis. Disease may be so uniformly distributed, that it is impossible to say that one part suffers more than another, or it may be so localized and restricted to a part that its general influence is hardly noticed. Yet in most cases we will find the two associated together. It is difficult to find a person so uniformly constructed that there is not some weaker part, and in disease which otherwise would be general, this weaker part suffers. There is no part so disconnected with the organism as a whole, that can suffer disease without influencing the body at large.

Though the body, so varied in function is one, yet it is of advantage to think of disease as being general and local (in principal part) and associate with these ideas thoughts of general and local remedies. To get a fair conception of the elements of general disease it is well to think of those functions which are common to the entire man, or which arc equally necessary in their results to the entire man. And to get a fair conception of local disease, we study the function of each part, in so far as it can be dissuerved from the life in its totality. We might make a group of elements of general disease somewhat as follows:

<table>
<thead>
<tr>
<th>Formative—for organization</th>
<th>Heat Conditions of life and motion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Force……………………Heat</td>
<td>Electricity Increased</td>
</tr>
<tr>
<td>Electricity</td>
<td>In its circulation…….Diminished</td>
</tr>
<tr>
<td>Retained excreta</td>
<td>In its organization With reference to nutrition, to degenerations, deposits and growths</td>
</tr>
<tr>
<td>Influenced by</td>
<td>Malaria. Zymotic poisons Specific poisons For the supply of oxygen</td>
</tr>
<tr>
<td>The Respiratory Function</td>
<td>For the removal of carbonic acid As an aid to the circulation</td>
</tr>
<tr>
<td>From the sympathetic, coordinating the vegetative process</td>
<td>Reason Emotion Sensation</td>
</tr>
<tr>
<td>Innervation</td>
<td>From the spinal cord, as influencing the automatic function</td>
</tr>
</tbody>
</table>

It is not necessary to consider each of these in this place, but having them grouped before the eye, the mind can analyze each one as a factor of disease, and combine them in natural group, as usually seen. The mind not only recognizes them as general elements of disease, but will soon learn to recognize the common expressions of wrong, according to the classification of excess, defect and perversion and it will soon go further than this, recognizing remedies which reach each individual element. and do that necessary to he done-opposing the morbid action and influencing the function toward the normal standard. If there is an excess-above, the influence is to bring down to a standard of health. If there is a defect—below, the influence is to elevate or bring up to the normal standard, and if there is a perversion—a departure from, the influence is to bring back to the normal standard.

We have already noticed that none of these elements of general disease can exist without
producing more or less local disease, and we may also say without influencing the entire series named. With reference to local disease, we find it severe and destructive in proportion to the severity of the general lesions. So, too, we find that the influence of some of these elements of disease sets up a series of lesions which are severe in proportion to the severity of the original one. In both cases general remedies are most important, and in so far as they rectify wrongs, and restore normal structure and function, they are most important.

In some cases the general lesion determines the character of the local OIlC. This is especially the case when the general lesion is of the blood, giving cacoplastic or aplastic deposits. An inflammation may spring up. Simple in its character from the common causes, and if there had been no wrong of the blood, it would have readily passed away by resolution. Yet, there being cacoplastic material in the blood, this is thrown out as an exudation, and, breaking down, causes most serious destruction of tissue. If in such cases as this the character of the general lesion were recognized early, and proper means employed to remove the imperfect material by way of the excretory organs, and so improve digestion and blood making as to prevent its renewal, the local lesion would be less severe and destructive. In place of a "white swelling" or "morbus coxarius," the inflammation would run its regular course of six to nine days to resolution.

If we take the case of phthisis pulmonalis, we find another good example. Say there was an original want of formative force and in consequence there is continuously produced an imperfect material in the blood. Its deposit in the lungs comes whenever from any cause excretion is arrested preventing its normal removal and when an irritation of and determination of blood to the lungs is set up-the material being carried to the lungs and there excreted. In this case a rational practice of medicine looks first to an increase of formative force, getting thereby a better blood, better tissues, and a stronger life. When the disease has once developed itself, the treatment will, of course, look to the establishment of the processes of combustion and excretion-removing the material from the blood in this way-and the arrest of irritation of the lungs, which is the cause of the deposit there.

If we take the single factor, heat, as the example, we find the very same state of affairs. If, for instance, we have the lesion of the blood known as "typhoid," we find that its increase is in proportion to the wrong of the temperature. If we have an inflammation of the lungs, the local disease is destructive in proportion to the increase of temperature.

If we have a phthisis pulmonalis, the deposit is rapid in proportion as the temperature is high, and the destruction of lung tissue is in the same ratio. We say, therefore, that diagnosis by the body thermometer must suggest a class of general remedies which will prove efficient in modifying and arresting general and local disease.

There is no doubt but that lesions of excess and defect of electricity, as a condition of life, and as a force, have a similar influence upon disease. Plus electricity, and we have increased disease by excitation; minus electricity and we have increased disease by want of excitation. The diagnosis will be formed in most cases by the degree of excitation as manifested by expression and the proper remedies will suggest themselves to relieve the body of its superabundance, or to employ means which will add to or prevent its waste.

When we study the circulation of the blood as a factor in disease, we see how marked the influence of one of these general wrongs is. Given a lesion of frequency in movement only, and we find that any morbid process is increased in proportion. Secretion is arrested, the appetite is lost, blood making and nutrition are impaired, waste is interfered with, and every cause of disease intensified. Wrongs in the circulation other than frequency give the same results. Even an unequal circulation of the blood may lead to such serious impairment of function as to be a cause of death. Evidently the diagnosis of these general wrongs, and the use of remedies to reach them, are of prime importance.

When we study the influence of lesions of the circulation upon local disease, we find them playing the same important role. If you have a local disease, inflammatory or otherwise, it will be to a considerable extent severe and destructive in proportion to the lesion of the circulation. If we have an inflammation of the lungs, it will be severe in proportion to the frequency and wrong in the circulation. With a pulse of 100 beats per minute, and free, there is little danger; but with a pulse of 130, small and sharp, there is most serious danger. If in such case, the lesion of the circulation can be removed, the local disease will be modified in proportion.

Continuing on with this classification, attention might be called to the next group-the blood influenced by certain causes of disease. Take first retained excreta, and we have a most excellent example of the need of diagnosis by this classification. We are treating an injury, a wound for instance, and everything progresses well, until from some cause one or more secretions are arrested.

At once we see a change in the local disease, the part suffers, its temperature rises, becomes
painful, the process of repair stops, the exudation is changed in character, the pus is unpleasant, and finally the repair accomplished is broken down, and it may be the part sloughs. Surely it is well to be able to recognize this wrong, and bring such means to bear as will reestablish waste and excretion.

Or a person from some common cause may have a simple fever. At first there are no unfavorable symptoms, and we reasonably expect a speedy convalescence, but from some cause there is arrest of secretion, which is retained in the blood. All the febrile symptoms are increased, and in addition we notice in the brown tongue, sordes, etc., the evidence of sepsis of the blood. Here it is well to recognize the importance of this general element of disease, and by early recognition prevent the unpleasant consequences named.

Malaria has played a most important part in disease, and the reader will at once recognize its importance. Given a case of disease, most simple in form, seemingly, and with this element characterized by periodicity, the disease may go on from bad to worse, until, possibly, death results. It does not make much difference whether it is a fever, an inflammation, or some other disease.

If we take inflammation of the lungs, the recognition or non-recognition of this element of disease (periodicity) may be that upon which the life of the patient depends. Remedies directed to this special element, the disease goes on to destruction of the lung tissue. With quinine properly administered, it runs a brief course, and terminates in resolution.

The influence of zymosis is well illustrated by erysipelas. You notice the swollen, red, and glistening spot on the skin, and as the patient complains of the peculiar burning, you call it erysipelas. If your attention is not called to the element, zymosis, by the peculiar tongue, pulse, condition of innervation, etc., and you prescribe empirically at a local inflammation, you may lose your patient. Recognizing the zymotic character of the disease, and prescribing proper remedies for this, the patient gets along well. Dysentery is another excellent example of this. In the minor sporadic cases, a few small doses of castor oil, or some mild laxative, may serve the purpose, and the sufferer gets well after a time. But do not trust zymotic dysentery to this treatment. Here the wrong of the blood, causing typhoid symptoms, is the principal factor of the disease and the element of danger. It is to be met by specific epidemic remedies, or those which we class as anti zymotic or antiseptic.

We get a practical example of these lesions in the case of syphilis. A man finds a small sore on his penis, which as yet has given him no annoyance, and if he has no experience with such things, he would expect it to disappear as rapidly as it came. But as days go by, it gets larger, and seems more prominent, and after a time comes skin disease, sore throat, falling of the hair, iritis, nodes. etc. Surely there is something more than a simple abrasion here. Supposing the physician should only recognize it as a sore, ignoring the specific poison of syphilis, what would be the success of treatment? And yet he could do this with quite as much credit as to fail in recognizing the specific wrongs in zymotic dysentery, in typhoid fever, in smallpox, in scarlet fever, or in measles.

If we study the function of respiration in its influence upon processes of disease we reach the same results. With wrong respiration, every other wrong is intensified; with right respiration, ameliorated. There is such a thing as too much oxygen, and consequently increased burning and excitement, just as there is such a thing as blood loaded with carbonic acid gas, and so burdened that the varied functions of the body cannot be properly performed. Surely it is worth our while to endeavor to diagnose these conditions, and to employ remedies which directly reach the wrongs and remove them.

When we study the lesions of innervation, we are impressed with their influence upon all parts of the body, and the necessity of directing the mind to them in all forms of disease for the purpose of diagnosis. Whether our senses will detect a lesion, frequently depends upon our method of thinking.

If we study thoroughly the physiology of the sympathetic nervous system, and get correct ideas of its controlling influence over all the functions of vegetative life, we will always direct our observation to those expressions of disease which give information with regard to this. Remedies influencing disease through the sympathetic are among our most important therapeutic agents, and fortunately the expressions of disease are quite clear. If we commence with the lesions of the circulation-frequency of pulse, change in its character-lesions of temperature, change in the condition of the skin. Some changes in muscular expression, change in the respiratory function, we will find a group of symptoms that are distinct and expressive, and so closely associated with individual remedies, that the remedy is at once suggested by the symptoms.

The influence of lesions of spinal innervation is well known in many cases of chronic disease, where "spinal irritation" is a complication. A disease of the digestive or urinary apparatus may seem quite clear and simple-one that remedies will readily reach, and yet when we prescribe them there is continued failure. We have failed to recognize a "spinal irritation," but from this wrong of innervation,
the local disease is continuously kept up.  
If the special wrong is diagnosed and proper means used for its relief, the remedies which had before failed with the local disease are more speedily successful.

We get another good example of this in some cases of continued fever, and other low forms of disease. A patient is doing well enough, other than he cannot sleep from difficulty of respiration. When awake the respiratory function is carried on by the influence of the will, but when this is in abeyance, the automatic function of the spinal cord is not sufficient. Unless this wrong is recognized, and means employed to rectify the wrong of spinal innervation, the patient will probably die.

We may get evidence of similar wrong, in one case in retention of urine, in another case of incontinence, in a third in convulsions or muscular wrongs, and in all we are impressed with the importance of remedies that influence the spinal cord, and influence it in the direction of health. It would be most absurd to omit from our diagnosis the evidence of a convulsive tendency and it would be quite as absurd to omit to look after and recognize any evidence of spinal lesion. The wrong of spinal innervation is often overcome by small doses of nux vomica.

When we study the functions of the brain we find them exerting similar influences over the body at large, both in health and disease. It will not do to undervalue a right action of the mind, as an element in the recovery of the sick as it will not do to undervalue a wrong action of the mind in perpetuating disease. Given a mind at ease and restful and a patient may recover from disease or injury which, under other circumstances, would most certainly be fatal. So true is this that we should always be on the watch for symptoms shadowing forth the condition of the brain. The querulous voice, the voice and expression, the unstable voice, the tone of the tone of prostration, all convey valuable information, which must not be neglected.

We find cases in which an emotional wrong may originate or so intensify processes of disease as to endanger life. A very familiar example of this is found in nostalgia or "home sickness". In the Civil War in the United States it was found that this so influenced disease in the hospitals, at times, as to double the mortality; indeed, many times a furlough to go home was the only reprieve from death.

"Hope is an anchor" for many wearied and suffering souls, binding them to this world, lightening their suffering, and giving increased strength for recovery. The want of hope is one of the most serious things we have to contend with in disease. To give hope to the sick is one of the many duties of the physician. It is possible that some may give little credence to the statements regarding the influence of the emotions in disease. And yet everyone practicing medicine for some years will have seen the influence of love, fear, anger, grief, etc., so clearly manifested, that there can be no mistake in the matter.

Grief is sometimes so profound that every function of life is seriously impaired, and unless the current of thought can be changed there is danger to reason or life.

Every physician in active practice has realized the influence of the will upon disease, and everyone will wish to know the condition of this function in serious or protracted disease. The evidence of a strong will, and determination to get well, is a real encouragement to the physician, as the want of will in this direction is a great discouragement. If we recognize a want of volition in severe or protracted disease, we do all we can to call it out and strengthen it, and in so far as we do this our patient is benefited. Even in the treatment of a cough we find this is important. If the patient can be impressed with the importance of controlling the cough by the will, we will find it much easier to check it.

Physicians are always awake to wrongs of sensation, though frequently the only idea that follows is the use of means to obtund the sensibility of the brain. It is true that unpleasant sensations or pain intensify processes of disease, and wrong the entire body by depriving it of necessary rest, yet many times far less harm comes from this than we would suppose. Indeed, in the larger number of cases it is better that the patients suffer pain, than that they be relieved by the ordinary narcotics. If by the study of pain we can select a remedy for disease, then it becomes valuable evidence. A remedy in this case looks not so much to the removal of the pain, as the arrest of the disease of which pain is a symptom.

In the study of local disease becomes important in that it directs the mind to limited parts and functions, and thus specializes the wrong. We group the most important functions of the body, as of digestion, circulation, respiration, excretion, etc., and then study each particular organ or part.

If we take digestion, we study the function in the mouth, the stomach, the large and small intestine, and as influenced by liver, pancreas, etc. If a certain group of organs or parts do a particular
work, we will find diseases of it announced by wrongs of that work.

Thus the wrongs of function point us to the locality of the lesion, and a closer examination
determines the particular part or organ involved. Knowing the lesion of function, we readily determine
its influence upon the life in its totality, and upon other parts and functions. It is possible in some cases
to provide against these influences, by calling into action other functions which may be supplementary
or vicarious.

We have similar examples in the relation between the excretory organs-kidneys, skin and
bowels. If the function of one is impaired, or there are special reasons why one organ should have rest,
we call upon one or both the others to do additional work. In some of these cases the vicarious action
will free the blood from noxious materials and thus give a chance for recovery. In others, the relief of
the part from work gives an organ opportunity to recover its normal condition by improved nutrition.

In the study of local disease we not only have in mind the influence of changed function, but
also that which may arise from a change in the circulation, innervation, and nutrition of a part. We
cannot have an excess of blood in a part without depriving some other part of blood. We cannot have a
too rapid circulation in a part, without influencing the circulation at large.

We cannot have an arrest of circulation in a part without impairment of that blood, and a wrong
to the whole of this fluid. We cannot have a wrong of innervation of a part, without suffering of the
nerve centers and a reaction upon the body at large; as we cannot have a wrong of nutrition, or waste,
without general suffering from it.

As the mind grasps these varied factors of disease, it is better able to appreciate the present
condition, and provide against other phases of disease. We not only want to know the condition of
disease at the present time but we also wish to know, from this, what will be the probable condition
tomorrow, or some subsequent time. If today we call arrest the wrong: of life now present, and turn
the tide toward the standard of health, well. If not, we wish to make provision so far as we can,
against the wrongs which are likely to appear in the near future.

CHAPTER V.
METHODS OF DIAGNOSIS.

In studying the form of diagnosis to which we are now giving our attention, this question
naturally arises: How are we to find the expressions of disease? The question is easily answered when
we remember that man has knowledge of things external to him, by means of the general sense of
touch, and the special senses-sight, hearing and smell. We may ask then, when brought in contact with
the sick what do we feel, see, hear and smell that differs from the normal condition—health. What the
patient feels, sees, hears and smells is not so important for his senses are impaired by disease: they
have never been educated, and his mind is not in a good condition to receive impressions.

There must be great uncertainty in a diagnosis made from what a patient says and yet it is a too
common means of diagnosis with all medicine, If patients were wholly truthful there would be
sufficient uncertainty, for they have little knowledge of disease, little skill in observation, and from
disease they are incapacitated for reasoning. The patient cannot, in the very nature of the case, know
very much of his disease.

It is, therefore, unwise to believe anything that one is told in a sickroom unless it can be
corroborated by an examination of the patient. Take a patient who is imaginative, and by leading
questions and prompting; you can get the symptoms of every ailment to which man is subject; and the
story will have more consistence and semblance of truth, the more the patient knows of disease. The
nurse frequently as bad as the patient in this respect, and quite as easily led to exaggeration.

A good physician has better success in diseases of children than in other diseases, for the very
reason that he uses his senses, and prescribes for children from what he knows, instead of taking the
say-so of patient or nurse as a basis for his treatment.

In order to get a good basis for diagnosis and prescription in diseases of the adult, we must
suppose every patient a child—which they are in fact, so far as medicine is concerned—and give them the
same careful examination that we would to the child, and thus reach conclusions from what we know
rather than from what patients or nurses say.

We do not wish to lose the advantage of any information we may get from patients or nurses,
for there are some things the patient will know, and a little care will frame the questions so as to get at
the real facts. There are some things the friends or nurse will know, and direct questions will usually
bring straight replies. But there are many things that neither can know anything about, at least with any
certainty, and these should always be avoided.

All answers should pass in review of our own senses, and what we know of health and disease.
These are the judges, and if the evidence is good it will have their approval; if it does not have their approval we throw it to one side. We do not purpose receiving anything that is opposed to what we know of disease and we do not purpose believing anything that is opposed to the evidence of our senses.

In order to employ our senses successfully, however, we must know what expressions of disease are to be discovered by the sense of touch, by the sense of sight, by the sense of hearing, and by the sense of smell. In other chapters the various disease expressions will be so presented as to make them easily recognized by these senses.

CHAPTER VI
DIAGNOSIS FROM A PHYSIOLOGICAL STANDARD.

In this chapter it is proposed to examine the various functions of the body, setting up a physiological standard-health-and measuring from it. We find that all lesions call be grouped under three heads of-excess, defect and perversion-above, below, from. If once we are able to recognize these departures, and have a knowledge of the action of remedies upon function, we may make a rational selection. If the condition of disease is above the normal standard, we employ those means which will bring it down. If the condition of disease is "below" the normal standard, we employ those means which will bring it up. If the condition of disease is a departure "from" the normal standard, we employ those means which will bring it back.

The reader will notice that it makes no difference what "school" of remedies is prescribed from as it is quite as well adapted to the one as another. Take the large dose of some practitioners and the physician using it should know the locality of its action, and the quality of its action. And even when the action is secondary or indirect, this method of prescribing is still good, for the mind associates the secondary influence upon a part or function with what needs to be done to restore health. If the modern Eclectic prescribes the usual dose of specific medicine, he has clearly in view its direct action upon a part or function, and he associates the action of the drug with that which needs be done to oppose disease and restore health. Our homeopathic brother, with his minute doses, frequently prescribes on the same basis. He knows where the disease is, and he prescribes a remedy which especially influences that part; he knows the character of the disease, and he prescribes remedies which his experience has shown oppose the disease and favor the return of health.

Having thus shown the advantage of this study as being applicable to all systems of therapeutics, and even adapting itself to each individual it may be well to call attention to its value as a training the mind, and a study of the phenomena of life. "Thinking in straight lines" has been our motto, and most certainly this is such method of thought. As we educate the mind, it will do our work, and this is one of the best studies. This is a study of life in all its phases. It is a study of normal life, for without this it has no basis. And it is also a critical study of wrong life in all its phases for this is its end.

It may be well to call attention again to the too commonly received methods of examination and diagnosis-direct and by exclusion. In direct diagnosis the symptoms are marked and point directly to the locality and character of the wrong. But in some cases there are no such direct symptoms, and we proceed to make an analysis of the life before us, questioning each particular part or function, until we have found the seat and the quality of the lesion. This is diagnosis by exclusion.

Formative Force.

The force of organization is received by inheritance, and the rule reads-as is this force in the parents, so will he its manifestation in the children. Thus it is sometime:--an important element in diagnosis to know the parentage, and, in so far as we can, their physical history. From feeble parents we usually expect feeble children. From parents who had had an imperfect organization, and wrongs of blood, degenerations, deposits, and growths, we expect children with like imperfect organization, and with the same tendency to disease. If we know that parents have died of phthisis pulmonalis, or other tubercular disease, a cough or articular irritation has a deeper signification, and we are wide awake to the necessity of early means for protection.

If parents or near relations have had cancer, we view with suspicion any growth that may make its appearance. If they have suffered with Bright's disease, diabetes, epilepsy, insanity, or other similar diseases, we are advantaged by knowing the facts.

The force of organization is rarely in excess, probably never, as regards the whole man. Once in a while we notice examples of it as affecting parts. Thus we may have hypertrophy of the adipose
tissue: hypertrophy of the bone; of the epithelium; of cellular tissue, taking the form of growths. All of
these will be readily recognize, though it is not so easy to find remedies which will arrest or modify the
condition. Still, bearing in mind the distinction between the unknown and the unknowable, we may
expect to find remedies for even such wrongs as these.

The wrong of defect is very common, and met with in many cases of disease. We recognize it
in defective or feeble nutrition, parts being small, wanting normal solidity. and lacking the usual
capacity of our standard man. The functional activity is usually the measure of the force of
organization; for though the organism in such case may for a limited time give a large amount of work.
it is rapidly exhausted, and require much more than the usual time for recovery.

We may learn that such defect is inherited: that it is the result of bad conditions of life; that it
results from overwork, or is caused by disease. Whilst we cannot rectify the present wrong of
inheritance, we can provide to a certain extent against this in the children of the future. But in the other
cases the treatment is quite plain-we rectify the conditions of life and make them healthful; we prevent
over-work and remove such diseases as influence nutrition. Following this we observe the great law of
development-"as a part or function is rightly used, it gains size and capacity." As we exert the force of
organization, we call into right action that which the person has. and as it is thus normally used, it
grows.

Heat.

The normal temperature of the human body is 98° and a fraction, say 98.4°. To have healthy
life this must be maintained, with but very slight variation, even the change of one degree producing
disease. The temperature is accurately determined by the body thermometer, applied in the axillae or
under the tongue.

Excess of temperature is met with in fevers, inflammatory diseases, and most diseases
accompanied with change of structure. As a rule, the excess of temperature is associated with
 corresponding frequency of pulse, frequent respiration, arrest of excretion, digestion and nutrition. In
proportion to the excess of temperature is the activity of causes of disease, of wrongs of the blood,
and a tendency to destruction in local disease. Thus, to a certain extent, the excess of temperature
which we can measure so accurately, becomes a means of diagnosing all the wrongs of life.

The saving feature is the diurnal variations in the range of temperature. Though in protracted
disease it may reach the height of 105° to 107°, at some period of the day, it falls to 103°, to 102° at
others, and in this fall of temperature the person has a promise for the maintenance of life. When the
high temperature is maintained throughout the twenty-four hours, the disease is necessarily of short
duration. either in a fall of temperature and return to health or in death.

Excess of temperature calls for remedies which lessen the processes of combustion, and
provide for the better removal of heat. Wrongs of sympathetic innervation (excitement) are associated
with excess of temperature, and here rhus, bryonia, gelsemium, lobelia, etc., become remedies.

Excitation of the brain and spinal cord is associated with excess of temperature, and when noticed calls
for remedies which relieve such excitation. Lesions of the blood, especially those of a septic or
zymotic character, are associated with excess of temperature. and allitzymotic remedies are suggested
in these cases.

The skin is the regulator of the temperature of the body. In the continued evaporation from the
surface, excess of heat is removed. With a high range of temperature the function of the skin is
impaired, and transpiration more or less arrested. among the serviceable means to remove the excess of
heat, are those that put the skin in better condition, favoring transpiration. Among these means, baths
hold a prominent place, and should not be neglected.

Excess of temperature is quite as important a factor in chronic as in acute disease, and its
recognition is an important element in diagnosis. Whatever may be the wrong, a range of temperature
of 100° and over means a continuation of the disease, and, eventually, a destruction of life. On the
contrary, amendment is always preceded or associated with a fall of temperature, and if this is
maintained at the standard of 98°, we may expect recovery. Thus, in phthisis pulmonalis. the range of
temperature is over 100° even in the first stage, and if maintained at this recovery is impossible.

If it can be reduced. and held permanently at or near the normal standard. the patient will
improve. There seem to be three factors in this high range of temperature which require study-the
frequency of circulation, a wrong in combustion, and a defect in the means for regulating the
temperature. In some cases remedies directed to the wrong of circulation are most efficient, as when
we employ Veratrum, digitalis, cactus, lycopus, etc. In others the wrong is of combustion, either in a
deficiency of some element of the blood, or in an undue excitation of the nerves governing the
respiratory function. For the first we think of cod-liver oil. the hypophosphites, sulphur, and
appropriate foods. For the second arsenic, phosphorus, rhus, bryonia, belladonna, lobelia, etc. In the third the lesion of the skin is prominent, and calls for such means as will restore normal functional activity. It may be the use of baths-alkaline, acid, stimulant, tonic, astringent, injunction-or the use of internal remedies that specially influence this organ.

Deficiency in temperature is less frequently met with, and not so easily diagnosed. If the thermometer in axillae or under the tongue shows 98°, but there is coldness of the extremities and surface, showing in some places not more than 90° we have determined our case. Or possibly we may find that the normal condition of heat, 98°, can he maintained in a state of rest, but there is little surplus for motion-we have heat as a condition of life, but not as a force. In the last class of cases, the want of power, with exhaustion and lowered temperature after exertion, tells the story.

Deficiency of heat may be dependent upon want of calorific food upon wrongs of digestion, upon the want of some special material in the blood to facilitate combustion, upon deficient innervation, upon a wrong of the skin permitting heat to be wasted, and upon an impairment of the respiratory function. In our examination of the sick, the mind at once determines a comprehensive plan of examination. and our inquiries proceed in this regular order-with regard to food, with regard to digestion, with regard to the need of special material for the blood, with regard to innervation.

With regard to the condition of the skin, and with regard to the respiratory function. Finding the principal wrong, the mind at once turns to the remedies that influence the part and function, and selects from them the special agent or agents that do that which needed to bring the part or function back to its normal condition.

Unequal distribution of heat is not quite as important an element of disease as excess or defect, but in some cases plays a not unimportant part. If in long-continued and severe chronic disease we have this unequal temperature-the trunk being too hot, the extremities cold-no means will prove curative until the temperature is equalized. Inequalities of circulation and temperature are very common elements of disease, and recovery in many cases largely depends upon their being rectified.

There are some peculiarities in the temperature that the thermometer will not recognize. For instance, in some cases of zymotic disease, typhoid and typhus fever, protracted disease showing symptoms the hand placed upon the skin gets a sensation of pungent heat, very like that when it is placed upon a surface reddened with mustard or cantharides. The sensation is very distinctive to most persons, and give the idea of sepsis, and unnatural irritation of the vegetative nerve centers. There is nothing more certain than this evidence, whenever it is presented, and we are at once awake to the danger to life, and the necessity of means to overcome the morbid process going on in the blood, and to relieve the over-excited nervous system.

At once we examine our patient with reference to the indications for the special antiseptic-muriatic acid-the alkaline sulphite, sulphurous acid, chlorate of potassium, echinacca, or Baptisia, and with reference to the remedies which influence the nerve centers-aconite, veratrum, rims, gelsemium, etc.

Nutrition.

In studying the diagnosis of lesions of nutrition, we observe the same order, having clearly before us the factors-food, digestion in the mouth, stomach, intestine, the process of blood-making, the circulation, the condition of the tissues with reference to appropriation, and even the adverse side, retrograde metamorphosis. Anyone or more of these factors may be wrong, and we desire to so localize it that we can select our remedy with certainty. We must know the exact location and character of the lesion if we are to prescribe with certainty.

Many wrongs of nutrition are dependent upon a want of proper food. In this country, where food is abundant, it is not as frequently the want of food in gross as it is a want of proper selection and preparation.

We not unfrequently find that food is the wrong kind, though it may be good in quality and well prepared. If a man wants animal food, vegetables containing a large proportion of starch will not answer well; if he wants calorific food, it does not do to feed him upon beef-tea. Again, we must have regard for the Power of appropriation by the individual, who may be able to digest certain varieties of food when he cannot other.

Wrongs of buccal digestion are easily diagnosed in the majority of cases by the history given. The patient eats rapidly, “bolting his food,” which is not properly chewed or insalivated. Or he may be an habitual tobacco chewer or smoker, and thus by continued abuse of the salivary glands have so changed the character of this secretion that it cannot do its work.

The treatment of such cases is very plain. The patient must be instructed as to the uses of the mouth, and the necessity of amending his bad habits. Abundant time is to be given to each meal, and the food thoroughly masticated.
The wrongs of stomachic digestion are frequently announced by unpleasant sensations which
the patient refers to the stomach, anti points you directly to the seat of the trouble. We have the
evidences of indigestion, and a wrong of blood-making and possibly of nutrition, in addition to the
localization of unpleasant sensations. Of course, the unpleasantness varies in different cases, and has
the entire range between sensations of fullness, weight, heaviness, to the most exquisite pain.

But having thus localized the lesion, we have only to make a commencement, for it is necessary
to know its character. and this may he determined in part by the sensations of the patient, and
examination of the tongue and the epigastrium, and by the discharges from the stomach. It is possible
first to arrange these lesions into two classes—irritative and atonic—and even to make these classes
embrace structural lesions. Probably this is the simplest, as it is certainly the best classification,
because it points out the remedies required. Remedies influencing the stomach are readily divided into
sedative and excitant—the one removing irritation, and the other giving stimulation.

The evidence of irritative lesions is found in uneasiness or pain of a somewhat acute character,
tenderness on pressure over the epigastrium, and in many cases by injection of the papillae of the
tongue, especially of the tip and edges, giving the characteristic redness. We have every degree in the
intensity of these symptoms, from the slight irritation with determination of blood, to the well-
developed inflammation.

With these evidences of disease. the mind at once turns to those remedies which allay irritation-
hydrocyanic acid. peach bark, minute doses of aconite, ipecac, rhubarb, bismuth, and some of the
simpler stomachic bitters, as hydrastis. If we have the general indications for a group of medicines, we
will find it much easier to select the special one which will be most efficient.

The reader will notice that these remedies are alike applicable in all cases characterized by
irritation and determination of blood, even in cases of severe structural disease.

The evidences of atony are impaired circulation and innervation, and want or perversion
of function from this is found in sensations of weight and fullness in the epigastric region, a sense of
oppression referred by the patient to the epigastric region. When we examine the patient we find that
the expression of the face is dull, the movements listless and show a want of energy. If we examine the
tongue we find it full and expressionless, in some cases pitting where it comes in contact with the
-teeth. As a rule there is increased secretion of mucus, and the bowels are constipated. The symptoms
above named point the physician to that class of remedies which are topical excitants to the
-stomach, and that stimulate a better circulation and innervation. Nux Vomica and strychnine may he
taken as the type of such stimulants, and are frequently employed when the impairment is temporary.

The bitter tonics—stomachic tonics—are the remedies usually selected when the impairment is of
longer duration; hydrastis canadensis, gentian, columbo, etc., may be taken as examples of this class.
With atony there may he irritability and in such cases the remedies might he amygdalus persica or
matricaria chamomilla.

Atony with increased mucous secretion will be marked by the coated tongue, yellowish or gray,
especially toward the base. full and expressionless features, dull eyes; and evidence of oppression.
These symptoms suggest a consideration of the properties of kali muriaticum. A mild laxative and
saline diuretics may here prove useful.

Excess of gastric juice will usually be known by its eructation, the sense of acidity of stomach,
elongated papillae of the tongue tipped with white, and maldigestion. For if we think of remedies that
allay irritation or that remove diseases of which this is sympathetic, as of bismuth, powdered charcoal.
the alkalies, or the acids, as may be indicated by other symptoms.

Deficiency of gastric juice is shown by maldigestion and eructations of undigested food for
some hours after eating. It may require stimulant tonics, acids. alkalies, podophyllin, etc. Recognizing
the deficiency, the mind is directed to the cause and when determined the treatment will be very direct
and certain.

Excess of acid is determined by the eructations, and the sense of acidity but if of the blood as
well it will be shown in pallor of mucous membranes. Whilst the alkalies would seem to be the direct
remedies in the treatment of these cases, they are really curative only where there is evidence of this
lesion of the blood. In other cases the cause must be determined. Sometimes it is a wrong of
innervation, and when this is removed the acidity ceases. In some cases, indeed, acids have a more
direct influence in effecting a cure than the use of alkalie.

Deficiency of acid may be known by the unpleasant fluid eructations, greasy if fatty matter is
taken as food. The general defect will be shown in the deep redness of mucous membranes, and
wherever blood comes to the surface.

This is sometimes the cause of serious functional wrong, and until the acid is restored digestion
will not be well performed. In these cases we think of muriatic acid as the remedy, though in many
lactic will give the best results.

The symptoms pointing to pepsin as the remedy are not very direct. Indeed, if we should say there was an entire absence of symptoms it would be a better guide to the physician. Given a case in which there is indigestion or enfeebled digestion, and there are neither evidences of irritation nor atony, acidity nor alkalinity, or wrongs of innervation or disease of which this may be sympathetic, and we would say, give pepsin.

The wrongs of intestinal digestion require care in diagnosis as many of the symptoms are obscure and indirect. The lesions may be classified as in the case of the stomach, into irritative and atonic, and the sensations of the patient if they are described will usually lead to a correct conclusion. The pinched expression of face, the loss of adipose tissue, giving a shrunken appearance of the body, the contracted tongue, slick, seemingly divested of papil1ae, tell the story of irritation.

The atony will be indicated by fullness in the abdomen, with a sense of atony as the hand is passed over it; the full, doughy tongue, inclined to be coated, and the general oppression of the nervous system, give very clear intimations of the character of the lesion.

The irritative condition calls for aconite, ippecac, matricaria, amygdalus, bismuth, the stomachic bitters, epilobium, etc. and they may usually be selected with considerable certainty. The atony calls for nux vomica, chelidonium, podophyllin, etc. In many of these cases the combination of podophyllin in minute doses with one of the simpler bitters answers an excellent purpose.

As a rule, good blood-making follows good digestion, and having secured the one we are not troubled to look after the other, yet sometimes we have the fault here and must rectify it. Good blood-making is dependent upon the conditions already named. There must be a normal temperature, a normal circulation, normal activity in use, normal waste and normal excretion. If there is a wrong of either factor we may expect some degree of wrong in the making of blood and in nutrition. If at any time we suspect this lesion we examine our patient thoroughly with reference to these important functions, and finding the wrong, whatever it may be, we right it.

There may be a want of some particular material in order to make good blood and good tissue. This has been recognized by physicians, and is the basis of that called restorative medication. We have already seen that the physician must select the proper food for his patients, and that much may depend upon giving histogenetic or calorific food.

"Restorative medication" an indefinite term, as used, and may mean remedies that stimulate an appetite, increase digestion, giving of proper food, as well as the use of those agents which add a needed constituent to the blood. It would be better to restrict the term to the use of agents that enter into the formation of the blood and the tissues. We may sum up these as iron, sodium, lime, potassium, sulphur, silica and copper. These may not be all, but if we can get a clear conception of their use, the wrongs that follow their defect and the symptoms that point them out, we will do well.

As iron is the coloring material of the blood, want of color is generally regarded as indicating the use of this remedy as a restorative. In some cases the evidence is sufficiently clear, and when iron is given the effect is direct and positive.

If taking the symptom "want of color from blood," we are careful in our examination to exclude those cases where other and primary lesions exist, the certainty would be almost absolute. But there is another indication quite as certain as "want of color" when tissue, especially the tongue, show a solid but not deep blue. In these the action of iron is specific. Again, we find certain lesions of the blond. more noticeably those which give an erythematous eruption (erysipelas) in which the redness is dirty or dulled in which iron is specific.

When the diagnosis is carefully made, the action of iron will give great satisfaction. A recent case of uterine disease of long standing with greatly impaired nutrition, presented as a prominent feature frequent erythematous eruptions of this dirty, though somewhat vivid redness, and the cervix uteri and vaginal tissues presented the same color. Iron, three times a day, was sufficient to effect a cure in a month. In another, where there was impaired nutrition-of many years' standing, and no direct symptoms but the solid blue tongue, the patient made a quick and good recovery on iron alone.

The best indication for phosphorus in its varied forms will probably be found in the want of expression, both in the face and in movement, an enfeebled respiration and unequal temperature. The sensations of the patient may point to impaired nutrition of the nerve centers, or simply to a general failure of life. The indications for phosphorus in the ordinary dose, are invariably of atony-impairment of the circulation and innervation. In a minute dose it may be used where there are evidences of vascular and nervous excitement with enfeebled tissue-as instanced in low grades of in inflammation of the lungs.
Sodium is a true restorative in some conditions of disease. If deficient in quantity every function of life is impaired, and without its restoration recovery cannot take place. In some cases want of sodium is the basic lesion, and its administration all that is necessary for a cure. In others this deficiency is but one of many lesions, and the giving of sodium will be but one of the means employed.

The indication for the use of sodium is clear and unmistakable—want of color in mucous membranes—which are usually full. Usually we are guided by the tongue and the expression would be full and pallid—sodium. The indications for lime are not so distinct, but yet quite definite. We are in the habit of saying that lime is indicated in all idiopathic cases of suppurrative disease of cellular tissue. The very fact of inflammation with a low euplastic or cacoplastic deposit, not the result of injury, evidences a peculiar wrong and for this lime is the remedy. Furuncular disease in all its forms finds a remedy in lime. In the majority of cases, there will be pallor of mucous membranes, though in some cases they will be purplish or blue. Lime is employed in chronic disease of the lungs, with cacoplastic deposit. determined by a low grade of inflammation.

The indications for potassium will be found in pallor of mucous membranes, calling for an alkali, and impairment of muscular power. In most cases a dull, leaden hue of mucous membrane with pallor will point especially to the salts of potassium. A marked example will be found in syphilis, in which this coloration is the indication for iodide of potassium. In some cases a salt of potassium may be needed, even though the deep coloration calls for all acid; this is sometimes seen in scurvy.

Here the sodium is excess. potassium is defect, and the patient is cured by the administration of lemon juice and vegetables containing potassium in large quantity. The best indication for sulphur as a restorative is a change in or want of pigment of the skin and hair. In some cases the dull, dirty color may can for sulphur, in others the blanched surface. Rapid loss of color in the hair will sometimes be an indication. Sulphur is also indicated by a peculiar blue or leaden color of urine and feces. It would be designated by some "want of color," and so there is a marked lack of the natural coloring material of these excretions. The dirty or tawny skin with bluish urine is a good indication for sulphur.

Silica is indicated in ailments attended with pus formation. Whenever pus is found in an inflamed part of connective tissue or skin it may be employed. In some forms of septic infections it is a valuable remedy. It promotes suppuration, and in this way acts efficiently in abscesses. As long as infiltration, which can disappear in no other manner than by suppuration, continues, silica is the indicated remedy, and should he employed until the infiltration has disappeared. In cases where suppuration has ceased to be active, but the process lingers and pus forms chronic depots, small or large, fistulous or otherwise, it is a remedy of curative power. It is also useful in chronic gouty rheumatic affections. It stimulates the connective tissue cells, and aids in throwing off accumulated urates through the lymphatics.

A marked indication for the use of copper is the unpleasant greenish pallor of skin met with in some diseases of women and a very similar coloration of tongue. In some cases the patient has not lost flesh, and nutrition seems to be quite as good as usual, but there is a want of energy and power of endurance.

The bitter tonics are of value in cases in which the blood requires a bitter principle. In some cases the want of this bitter principle is the cause of serious disease, but at the present time it is not possible to point out any better evidence of the need of bitter tonics than impaired appetite, digestion and nutrition.

A right circulation is essential to carry well-made blood to the tissues where it is to be used. Wrongs of the circulation impair the quality of the blood, and the power of the tissues to withdraw from it the materials for nutrition. Thus in all cases of lesion of nutrition a right circulation must be maintained. In this connection attention may also be called to the necessity of having the normal temperature of 98°, which is a condition of healthy life.

A patient may have good food, good digestion and good blood-making, and yet there will be a failure of nutrition unless the tissues are in condition to appropriate the material and weave it into organic forms. We have no means of determining this condition of formative cells except by the physical properties of the tissues en masse. If they have normal hardness, elasticity, form and activity, we have reason to conclude that nutrition is good in so far as the power of appropriation is concerned. Conversely, we may say, if they lack hardness, elasticity, form and activity, there is a want of power to organize new tissue. Diagnosis is here made by the tactile and visual senses. and will be valuable just in proportion as they have been trained to use.

Concluding from these evidences that the tissues lack the power of appropriation, what will he the remedies? In so far as internal remedies are concerned, we have but few that influence the function of the formative cells. To a limited extent, some of the bitters may do this.
Yet when we subtract their topical influence upon the digestive apparatus in increasing the appetite and improving digestion, and the slight stimulant influence upon the circulation and innervation there but a small fraction to be accounted for.

Want of hardness, elasticity, and activity will show a want of nutrition, whilst the change in form, want of expression-dull and lifeless—may be taken as evidences of a want of retrograde metamorphosis. We have already made reference to the great law of animal life—as an organism is used it gains the power of reproduction and increased use; as it is disused it loses this power. But it is well not to forget that over-use will impair reproduction, the forces of life being thus exhausted.

In many cases after providing for good food, good digestion, and good blood-making, a good circulation, normal temperature, and good innervation, we stimulate the appropriation of material by the tissues by well-regulated exercise. Or if the patient is over-worked, and thus exhausts his powers of reproduction by recommending rest.

In some cases the patient requires exercise under the influence of the will. Innervation in this way being of as much importance as the activity of tissue. In other cases it requires passive movement. With as little expenditure of nervous power as is possible. In some cases the stimulus of electricity becomes an important means, and by its general use normal nutrition of tissues may be obtained.

The character of deposits may usually be determined by the symptoms indicating the condition of the general health, and by the local appearance of the part when near the surface. Bearing in mind that good blood will give euplastic deposits, an inferior blood deposits, and a very poor blood aplastic deposits, we will be in a pretty good position to judge.

As regards the local symptoms, we may say that the inflammatory process, regular in its course, is the best evidence of euplastic deposit. All irregularities, whether of time, intensity, or of the common symptoms—heat, pain, redness or swelling—point to a deposit of lower character. So certain is this that the physician will very rarely make a mistake if irregularities cause him to employ greater vigilance. If, for instance, in local disease there is too much or too little heat, too much or too little pain, too much or too little swelling, too much or too little redness, or if the color is changed, we are sure the deposit, if there is one, will be low in character. So if the disease runs its course too rapidly, we conclude that the deposit will be of lower grade. So true is this, that we look with suspicion on all alterations of the inflammatory process, and we extreme care in the treatment of such cases.

Degeneration is not easily recognized and in a majority of cases progresses until the destruction is beyond remedy. Of course, granular degenerations of the kidney (known by albumin in the urine), and degeneration of the liver (known by jaundice), which present characteristic functional disturbance are not included in this statement. The gradually decreasing power of continued exertion is an important point in the diagnosis. Persons having degeneration will find themselves incapable of prolonged exertion. There is a want of expression in every part, and the soft tissues sit upon the bones like an ill-fitting suit of clothes. A want of sharpness and strength in the wan of blood as it passes under the finger is an additional element. In the treatment of degenerations we wish to re-establish this "renewal of life." While we want good food, good digestion, and blood-making, adding any agents of the class restorative that may be needed, and an active condition of the formative cells, we also want increased retrograde metamorphosis to remove the old and degenerated tissue. In so far as the tissue is degenerated it can never be replaced, but it is possible to so improve the function of nutrition that what yet remains may serve the purpose of the organism. The diagnosis of growths belongs to the province of surgery, and requires but a brief notice here.

They are classified as benign and malignant, and to determine to which of these two classes a growth belongs is the first object. As a general rule, we may say a benign is a growth from the tissues whilst a malignant is a growth distinctly separate from the tissue, and though it may be deeply seated it obtains room for its enlargement by separating them, and occupying the place of the connective tissue.

It may interfere with the nutrition and use of tissue by pressure and weight, and in rare cases when inflammatory action is set up may form adhesions to them, otherwise it maintains a distinct and separate existence. On the contrary, a malignant growth takes possession of the tissues of the body and grows in them, transferring the structure into its own lower forms.

It is no respecter of tissue, and occupies one quite as readily as another, taking possession alike of skin, connective cellular tissue, muscle and bones, using the fibrous tissue as its skeleton, and the blood-vessels, lymphatics, and nerves for its supply, waste and innervation.

The reader will notice that in any case it be possible to determine the condition of a growth from or in the diagnosis is readily made. A growth that does not interfere with or take possession of tissue is of necessity benign. Whilst a growth that does appropriate the normal tissues is as surely malignant. In a majority of cases careful inspection of the part will determine this.
A benign growth is generally of uniform consistence, smooth and of equal elasticity as the hand is passed over it.

The reader will readily see why this should be the case, as it has a single point of origin and supply, and consequently a uniform development. But in the case of a malignant growth, its consistence and elasticity will depend to a considerable extent upon the tissues it appropriates, and hence it will be of unequal hardness and elasticity-modulated.

There is a marked difference in the sensations of the part. The benign growth has no nerves, and any sensation experienced will be from its pressure or dragging upon adjacent parts. The malignant growth appropriates the nerves of the part, and hence interstitial pain of a peculiar character is usually found in these cases.

A benign growth has no lymphatics, and does not influence the blood other than by withdrawing the materials for its supply. On the contrary, the malignant growth appropriates the lymphatics as it docs other tissue, and furnishes through them a cancerous growth, which eventually produces the constitutional impairment so generally noticed.

CHAPTER VII. DIAGNOSIS BY THE SENSE OF SIGHT.

The eye which has been properly trained learns a great deal as it observingly passes over a patient, but the eye which has not been so trained simply sees it does not know how to obtain the valuable information spread before it. The educated eye requires no prompting to do its work in the examination of the sick. It takes in the appearance of the patient and his surroundings in all their detail. An effort of the will is then required to make the mind attentive, and to co-ordinate the impressions, and reach conclusions from them.

General Symptoms of Disease.

The general appearance of the patient is the first object to be noted. This will tell the probable age and whether the person being examined is fairly well generally, whether broken down by disease, or how far enfeebled, and give more or less direction to a proper examination.

Valuable suggestions are many times obtained by closely observing the attitude of a person applying for treatment. The patient may be bowed by debility, or by abdominal pain, or spinal disease; or bent to one side in order to give some part of the body rest, as in pleurisy, when the invalid bends to the afflicted side, so as to lessen the friction of the inflamed serous surfaces. There is a great variety of appearances to be observed. There is the pale, thin, cast down and unhappy looking woman with dyspepsia and troubles of various kinds in the reproductive organs, and the panting patient, with raised shoulders, who has chronic bronchitis and emphysema.

The liniments of struma are often distinctly manifested, especially in children, and the snuffles of a syphilitic baby are so characteristic that they cannot well escape the attention of the careful examiner. It is well for the physician to study types as well as marked varieties of disease and associate with them the parts or tissues involved, always keeping in mind the drugs which influence these parts and tissues and are thus likely to become remedies in all such pathological conditions.

When the types of disease have once become thoroughly understood, it will be easy to learn the peculiarities of an individual patient afflicted with any well-marked type. In time the eye learns to recognize a certain type of person with persisting lithiasis. and this will often enable one to comprehend the real meaning of a large number of symptoms and statements which would be otherwise incomprehensible.

There is a type common to elderly people which is as well marked as that peculiar to anemic young women.

There is a certain attitude and carriage which points out the victim of pulmonary phthisis. and leads one to examine the chest. A consumptive is often exceedingly ingenious and displays great quickness of intellect. but the patient suffering from chronic bronchitis and emphysema. or fatty degeneration of the heart frequently appears confused and stupid.

In chorea the movements usually point to a correct diagnosis. but sometimes the arm is so quiet that it looks as if paralyzed, and, in the latter case, unless the physician is very careful, an incorrect diagnosis may be made. In paralysis agitans the movements of the person are indicative of the changes in the nervous system. These must not be confounded with the tremor often seen in anemic women who drink tea to excess, or the tremor of the different muscles which tell of excessive use of stimulants and chronic alcoholism.

The physiognomy should be closely observed, as much may be learned from a thoughtful study of the face. The bowed-down look is marked in cerebral anemia. and the depression of melancholia is
very apparent, while the excitement of mania, the elation of general paralysis and the worn look of mental worry or anxiety are all plain enough to be readily recognized by the educated eye. The general evidences of nutrition and a well-fed nervous system. Usually with a full pulse, when once seen are without difficulty differentiated from the muscular listlessness of malnutrition, with a soft, compressible pulse.

Paralysis may he partial-the hand and arm being fixed-the remains of a former hemiplegia. This condition, however, may be simulated as a result of some accident or affection of the bones, or the patient may have slept with the arm in such a position as to cause severe pressure on the brachial nerve, and thus caused the apparent paralysis.

There are great differences in the attitude and manner of walking caused by different forms of nervous diseases and osseous changes. The walk of a patient suffering from ordinary hemiplegia is decidedly characteristic of the disease. In using the affected leg the toe of the shoe is trailed on the ground, sometimes the outside and sometimes the inside, so that the shoe becomes irregularly worn. Often the shoulder of the opposite side is thrown outward at each step so as to tilt up the pelvis on the affected side, and thus make it easier to continue the circular movement of the leg. Here the knee action is lost. Frequently the arm of the affected side hangs down rigid with the fingers closed. In paraplegia the feet are not lifted up, but shuffled along the ground. In advanced cases there is never a distinct interval between the movements of the feet, and each step does not reach the length of the shoe. In hysterical paralysis the feet are dragged along, usually one more markedly than the other, and the patient is inclined to drop in a heap. The fact, too, that the patient is a young woman should be regarded as very significant. In true paraplegia the patient does not drop so long as the power to walk remains. In pseudo-hypertrophic paralysis the patient waddles much like the walk of a duck, and most markedly unlike the walk of a person afflicted with double talipes varus. In locomotor ataxia the feet are lifted up very high and brought down with a flop. In diseases of the cerebellum the walk is similar to that of a drunken person, staggering, unsteady or reeling. In paralysis agitans the patient trots forward, the body being bent forward, with shaking arms held out in front. This is simulated, to some extent, in lead and mercurial poisoning.

In progressive muscular atrophy the rolling walk is much greater than that of the sailor, while the muscles of the ball of the thumb are wasted, and if the patient attempts to unbutton his clothes he does not try to use his thumb and index finger, but thrusts the upper edge of the buttonhole off the buttons with the dorsal aspect of his fingers.

In observing the walk of a patient one must be sure that the person has not an artificial leg, and that no osseous changes exist. In the early stage of hip-joint disease the leg is usually straight, carried slightly forward, or perhaps somewhat abducted, owing to the irritation and contraction of the capsular muscles on the anterior and outer aspects of the joint. As the disease advances the limb becomes adducted, so that the knee is carried against the lower part of the sound thigh.

It is always to be remembered that a patient's walk may be changed by an imperfect recovery from a fractured bone. A limp is often caused by a sprain or a tight boot, and the disturbances of the walk caused by corns should never be overlooked. There are also the altered walk of acute or chronic intoxication and the hobble of gout to be borne in mind.

The swinging round of the afflicted leg, instead of the straight forward step, is characteristic of hip-joint disease, frequently called rheumatic, and the same swinging movement is met with in rigidity of the knee. In children there is a peculiar walk, with the pelvis tilted up, which tells a story that points to morbus coxarius.

The diathesis, or inherited constitution of a patient, is of the utmost importance, and should receive thoughtful consideration. It often affords information which points to the liability of the patient to certain forms of disease, according to the diathesis. A certain diathesis may have engraved upon it a cachexia-an acquired condition-as, for instance, a person of a strumous diathesis may have a syphilitic cachexia. In such a case a malady will be presented which will be found to be very intractable, and one which will demand the exercise of all of the physician's therapeutic ability.

The gouty or sanguine arthritic diathesis is characterized by a well-developed osseous system, firm muscles, erect carriage and robust appearance. The nutrition is active, digestion usually good, anti the respiration deep. The heart is large, and the skin usually florid. The person has a large head and a large lower jaw, with solidly enameled teeth, which are often worn down. The hair is also strong and thick. The pulse is usually firm and steady, and the blood pressure in the arteries is high. Diseases of the vascular system-the gouty heart, with its almost innumerable associations-is common with this diathesis, and the high blood pressure in the arteries is very likely to lead to atheroma as a permanent condition, with apoplexy, aneurysm and angina pectoris as probable conditions. Hypertrophied left
ventilation, with or without valvular disease, ending in decay and fatty degeneration of the heart, are also among the serious conditions to which this diathesis has a tendency.

The strumous diathesis presents an imperfectly developed osseous system of the retrogressive type, either toward the infantile or a lower race form, both as to cranium and other bones. The bones of the thorax are small and the shafts of the long bones are slender. While their epiphyses are large in large bones, and the hand is unsightly. The forehead is often lofty and prominent, and there is a certain fullness of the lips and alae nasi. The eyelashes are long and silken. and, when this diathesis is decidedly marked, there is usually ophthalmia tarsi. The teeth are carious and the lower jaw is often light and thin. The hair is fine and thin and not infrequently of a light color. The eyebrows are arched or very straight and often very thick, especially in brunettes. The skin is often moist with acid perspiration, and defective nutrition is shown in the tissues. Diseases of the bones, such as morbus coxarius. rickets and spinal curvature are of frequent occurrence in children of this diathesis. There are also liable to be enlarged mesenteric glands. or a lardaceous liver. and. after puberty, pulmonary consumption and suppuration of the glands of the neck are among the abnormal conditions which may he expected. Women of this type frequently have a large number of children and then die early in middle life. Tubercular diseases, in all their forms, from meningitis in children to phthisis in adult life, are unusually frequent in the strumous diathesis. Syphilis is usually severe in strumous subjects. It is difficult to maintain nutrition in this class of patients, and, therefore, whenever there is disease of the osseous system, or of the lungs, careful and prolonged treatment will be needed.

As a class, persons of the nervous diathesis are small and far from fat. They are active, restless, unwearying beings, with small osseous framework, but with more muscular power than is usually possessed by more robust-appearing persons. They are very energetic and usually anxious to aid others in their troubles. The forehead is high and the skull is well vaulted, with small, well-formed features and an active-looking eye.

They are the most common subjects of overwork, and their nervous system often shows the effect of the excessive demand made upon it. They are often victims of visceral derangement, especially dyspepsia and constipation. They do not always readily respond to treatment, but they are liable to be very susceptible to narcotic agents, although at times they require very large doses of such medicaments.

This diathesis furnishes the greater number of persons who are said to possess "idiosyncrasies," and it is well for the physician to be very cautious in his dealings with them, and especially so if the patient is of the female gender. They usually prefer tea to alcohol, and before middle life are very affectionate, but when advanced in years, especially if they become gouty or rheumatic, they are often very irritable. Their family history usually reveals various neuroses among the different members.

The bilious diathesis manifests itself in a dark skin with black hair. and there is often a yellow tinge on the conjunctiva. Persons of this diathesis may be large or small and active or indolent, according to the influence exerted by the blending of the gouty, nervous or lymphatic diathesis with the bilious diathesis. When associated with the strumous diathesis the patient will be found to be a person in whom tuberculosis, if once acquired, will run a rapidly downward course. and, in this respect, resembling tuberculosis in the negro. Individuals of the bilious diathesis seldom become fleshy, and with them the hydrocarbons are not well assimilated. From their chemical composition acids can be traced in their origin from albuminoids of foods, and the presence of bile acids in excess in the blood of the bilious, affecting their intestinal canal, is as common as is lithiasis in the gouty. In each case the product is of albuminoid descent, and, therefore, abstinence in the matter of nitrogenizing foods and alkali cathartics should be enforced. It is in these persons that small localized spots of pain can be found or about the lower inner angle of the scapula. Why a waste-laden blood should give rise to these spots of pain is not well understood.

Persons of the lymphatic diathesis are usually large, unenergetic, listless and fleshy individuals. This diathesis is the direct opposite of the nervous diathesis. These patients are always in a condition of health far below the normal standard. and they require large quantities of nutritious food in order to possess an approach to a sense of energy. They usually have a large osseous framework, but their muscles are soft and their brains inactive. They are not usually florid, but, on the contrary, they are commonly pallid. They are never well in low-lying sections. They require treatment of a stimulating and tonic character when sick, and they should never be given depressants. Women of this diathesis frequently have menorrhagia and are almost never free from leucorrhea. In parturition they are liable to bleed profusely.

With each form of diathesis there is superimposed a cachexia. The gouty individual may be anemic or the subject of lead poisoning. Persons of this diathesis are very susceptible to lead poisoning. The strumous person may have gout, the nervous individual may be the subject of malarial
cachexia, and the lymphatic patient may have acquired syphilis. In all such cases it is necessary to keep in mind the diathesis as well as this cachexia, and to make proper allowance for both in the prognosis and treatment.

The cachexiae most frequently seen are malarial poisoning, anemias of varied origin, gout and syphilis. These cachexiae may be acquired in various ways—either from want of proper food, from mal-assimilation, from poisons formed within the body or absorbed from without, as lead in painters, plumbers and printers; mercury in gilders and looking-glass makers; arsenic from wall papers and other colored materials; copper from kitchen utensils, or tin from the canned provisions which are now so commonly used. In all anemias associated with a poison the antidote for the poison must be added to the remedies demanded by the specific indications.

The expressions of the face should be closely observed, as they often render a diagnostic aid which is of the utmost importance to the practitioner of specific medication. The choleraic face—that pertaining to cholera—is of an ashen hue; the skin is livid and the eyes are sunken. The Hippocratic face is pale, of a leaden hue, with sunken eyes, the eyelids separated, the cornea losing its transparency, the nose pinched, the temple hollow and the lower jaw falling.

This is the face of death, and when well marked recovery is impossible. In typhoid conditions the face is expressionless and dull, the lips and teeth frequently covered with sordes, and the patient lies flat on the back. In pyemia the expression is lost, or is that of dull indifference.

In peritonitis the upper lip is raised sufficiently to expose the front teeth in a manner which quite characteristic of the disease.

The twitch of abdominal pain which flits over the face, producing a twitching of the lips and contraction of the eyebrows with a frown, presents a picture of disease which, when once observed, can never be forgotten. The twitch is peculiar to disease below the diaphragm. It is best studied in the face of the parturient woman when the pains come on, especially in the second stage of labor.

The pallor blended with an expression of suffering, such as is seen in vertebral cancer, is the face of grave organic disease. It may be seen in abdominal aneurysm where there is spinal caries, in caries of the vertebra, in repeated angina, and with a lack of depression, in persistent headache, especially in that of organic origin.

The face of the hectic, the wanting, the general pallor, with the bright red spot over the cheek-hones, and the quivering of the nostrils, make clear the fact that consumption has fully begun a course which usually soon terminates in death. There are cases, however, when the family history is good, in which this condition is survived for many years. The tuberculous mass softens and is expectorated, and the patient recovers with a cavity in the lungs.

In examining a patient it is well to give the hair careful attention, as it often tells a story of great value to the practitioner of medicine. When it is strong and coarse it usually constitutes very good evidence of a strong constitution. If coarse hair turns gray early a gouty taint is suggested. Coarse hair rarely falls early, and it is often found thick and white in persons of great age. Thin fine hair is most frequently found in strumous cases, especially when the patient is very fair. It is the hair usually found on precocious children who are carried off in early youth by tuberculous disease in some of its forms.

Fine hair usually falls early, leaving only a fringe around the head. This condition is often seen in persons with lithiasis or chronic Bright's disease, but by no means in the subjects of these diseases only. It is therefore, simply suggestive. Graying of the hair on the temples indicates approaching old age. In some cases isolated very white hairs are found scattered through very black hair. This condition of the hair some authors believe to be suggestive of some pathological change in the kidneys, though not so advanced as to exert an influence of a grave nature.

Good nutrition of the hair is shown by its being glossy and bright. In some diseases, such, for instance, as advancing phthisis, the hair loses its luster, and becomes dry and brittle. It recovers its natural look and appearance as soon as health is restored. When a consumptive patient has not been seen for a considerable time the condition of the hair is often a very good evidence of the general state of the patient's health. A good full head of hair, like good teeth, usually indicates a good constitution, but there are many exceptions to be found, especially in persons of the strumous diathesis.

A close observation of the forehead will many times result in the acquirement of knowledge having an important bearing on the condition of a patient. When well vaulted the forehead forms a part of the nervous diathesis. When broad and rather low it usually goes with a stalwart frame and a bulky body. The lofty brow is usually accompanied by a thin flank, and small digestive viscera, and a liability to indigestion. The broad low brow is usually found in persons having square abdomens, large digestive organs, and good assimilation with a tendency to gout. The forehead may be protuberant from an excessive ossification of the centers of the frontal bones, and this is very likely to be found
with defective development of the rest of the bones together with wide fontanelles, such as are seen in hydrocephalic infants. This condition is also seen in the rachitic forehead. In rickets the child's head is often unusually large, the vertex flattened and the forehead prominent, broad and square, with considerable expansion at the centers of the parietal bones. Sometimes the sutures remain open. In other cases they close prematurely, and then the growth of the cranium is arrested, thus causing the infant to remain a child in intellect or become an idiot. In strumous children with a syphilitic taint the forehead may become so prominent as to project in front of the face. In these cases the arrested development of the facial bones intensifies the deformity.

In some cases the forehead may be regarded as a moral indication worthy of remembrance. A woman with a forehead which has become hard and ivory-like is said to be capable of denying pregnancy with the most unblushing effrontery, and of an utterly untruthful character when anything connected with improper sexual relations is involved. In some cases the forehead may be disfigured by one single copper-colored spot, telling a story which makes the diagnosis of syphilis positive. Ulceration of the fore-head is said to be always syphilitic, except when the result of a wound. Scars on the forehead, without a history of injury, are always suggestive. Something of importance to the physician can be learned by closely observing the eyebrows. When the eyebrows are exceedingly arched or unusually straight, and, still more, when they are also very thick and bushy, they indicate struma. If persons possessing such eyebrows become the subjects of phthisis it usually is a severe and rapid course. Severe and repeated attacks of facial neuralgia may lead to an increased growth of the eyebrows, especially at the outer extremity, and there may be a patch of dark-colored skin around it. It is well to remember that the eyelashes are also modified by the strumous diathesis. In the finer forms they are very long and silken, but when the condition of ophthalmia tarsi is reached their appearance is very unpleasing, and, at times, repulsive.

The condition of the eyelids is often suggestive. If there is edema under the lower lid, distinctly seen on rising in the morning and largely disappearing during the day, it may be associated with Bright's disease. This edema is often seen in ladies of middle age with pallor, and constitutes the anemic form. In advanced life it is not infrequently seen even along with a high complexion. An examination of the inside of the lower eyelid will often afford a very good idea of the amount of anemia existing in a case. The upper eyelid may be paralyzed, as in ptosis, showing that the superior branch of the third nerve is involved. A dark pigmentation of the eyelids is not unusual in pregnancy, where pigment changes are common. Sometimes there are patches of deep pigmentation on the brow as well. These pigment changes indicate pregnancy in some women at a very early period, a fact well worth remembering when examining cases of suspected pregnancy. They are likely to recur in the same woman.

The eye is capable of revealing to the physician many valuable facts not easily obtained through any other source. It should, therefore, be carefully studied. In exophthalmic goiter the eye is very prominent, except in slight cases. The conjunctiva may be stained yellow in jaundice and biliousness, or it may appear pearly-white in certain cases of Bright's disease. In persons who freely indulge in alcohol the eye is often unnaturally vascular. A squint is often an indication of hydrocephalus in infants. It is likely to be a momentary squint at first, but as the abnormal condition increases the squint becomes more persistent. In like manner a squint is developed in some brain diseases in the adult.

The cornea may be chronically inflamed at about puberty as a result of a syphilitic taint. Under proper treatment the inflammation may clear up, but if neglected permanent opacity is likely to result. At the union of the cornea and sclerotic a ring or bow is sometimes seen and known as arcus senilis. It is an evidence of advancing age, but it is well to remember that there are two forms of arcus—one suggestive of evil omen and the other of little if any significance. The latter being the more prominent of the two, unless considerable care is exercised unpleasant mistakes may be made. The innocent form is very distinct, with sharply defined outlines and a clear cornea, and iscalcareous in its nature. It is very common in pale old people, and especially so in persons with light blue eyes. It has no significance whatever. The other form, however, tells of tissue decay. It has badly defined edges. The cornea is hazy and cloudy from fat granules being scattered throughout the part. It is more pronounced under the eyelids, where the arcus is often seen very distinctly, when it is scarcely recognizable in that portion which is exposed to light. It is often well, then, to lift the eyelid when in doubt, as well as when the question arises as to whether or not there may be fatty degeneration in the fibers of the heart. The pupils should be carefully examined.

Sometimes the iris is the seat of inflammation, and the formation of a tubercle at the inner or free edge of the iris is common in syphilis. The pupils may be of unequal size. Contraction of one pupil is often found in aneurism of the aorta.
When the pupils are both extremely contracted the suspicion of opium poisoning should be aroused, or indulgence in some preparation containing opium may be considered. It is well, however, to remember that it is possible that the contraction may be the result of hemorrhage into the pons varolii. In apoplexy the pupil of the paralyzed side is usually dilated, but this is not invariably the case. In convulsions the pupil may be widely dilated, contracting again as soon as the attack is over. Dilatation of the pupil occurs just before death in opium poisoning.

A close observation will soon show the physician that the nose is not always far behind other parts of the body in telling an interesting story. The nostrils many times rapidly move and quiver in thoracic disease as well as in conditions of nervousness. When the bridge of the nose is markedly sunken inherited syphilis is suggested. The snuffles of syphilitic infants when once heard cannot be readily forgotten. The chronic inflammation of the bones of the nose, which is often set up in these children, may result in their arrested growth. The alae nasi may be flaccid, the tip of the nose often red and tuberous in chronic alcoholism, a condition which will be simulated by disease in some cases. This fact is well worth being remembered when examining women suffering from indigestion and constipation with or without pelvic complications. In these cases the tip of the nose is often red, while the nose is abnormally pale.

In many cases the condition of the lips is not unworthy of the physician’s attention. In strumous children they are fuller than usual, and a certain fullness of the lips, and especially the under lip, is said to indicate very strong sexual proclivities. Scars at the angles of the mouth, when not the result of injuries, may be safely regarded as an indication that the patient has had syphilis. Sordes on the lips and teeth usually accompany typhoid conditions.

A study of the vascular condition of the skin of the face cannot be too thoroughly made. The presence of a high complexion may simply indicate ten of exposure to cold—the vascular fullness protecting the skin from the cold to which it is exposed, and, on the other hand, pallor of the surface may indicate merely the opposite state—indoor occupation. In many other ways, however, the vascularity of the skin of the face may afford important suggestions. At times little tree-like things are seen where the small artery pierces the skin and shows upon the surface. These arterial twigs are said by eminent authors to be a part of the atheromatous changes which accompany the gouty heart. A hard radial pulse, an hypertrophied left ventricle, and an accentuated aortic second sound, are the associated conditions.

In this condition the urine is copious. Aortic dilatation, apoplexy, aneurism and angina pectoris are among the complications to be here looked for. As the heart fails there is arterial anemia, with pallor and venous fullness, with lividity about the lips. The temporal artery may be tortuous in young persons, and may even be seen to pulsate when a strong light fans upon the face. This, however, has no particular significance, but usually the condition of the temporal artery reveals that of the general arterial system. In aortic regurgitation the diagnosis may at times be made by observation of the temporal artery.

The impression of "balls of blood-shot under the finger," as applied to the sensation imparted on feeling the radial pulse, is conveyed to the eye; it is possible almost to see the ventricle rapidly impel its contents into the arteries, and then the sudden collapse as the backward flow, on the aortic recoil, is no longer arrested by healthy aortic valves. Such abrupt collapse indicates considerable shrinking of the free edges of the aortic valves, with the open condition aggravated by dilatation of the aortic conus. When the incompetency is blended with a rigid condition of the aortic valves, constituting obstruction, this sudden collapsing of the temporal artery is not found.

The atheromatous changes in the arterial wall may be of two kinds. In the one case the wall is thick and soft, suggesting the idea of being swollen. Here the pulse is comparatively soft, and fatty degenerative changes are associated therewith. At other times the pulse is small and hard, and then it is suggestive of visceral cirrhosis.

The radial artery and the temporal artery are both influenced in the same direction by like degenerative changes, whether the arterial system generally is the subject of fatty or calcareous degeneration. In some young men a parchment-looking skin is tightly stretched over the tissues beneath and the temporal artery is very conspicuous, being both tortuous and thickened. This condition is regarded by some authors as an evidence of a syphilitic taint. Syphilis and alcoholism expedite atheromatous changes in the arteries. The face may be distorted by paralysis. The features are drawn toward the sound side and the saliva dribbles from the palsied side; the cheek is flaccid and is blown out by a strong expiration.
The patient cannot frown with the affected side nor shut the eye, though that on the sound side is freely closed. He cannot whistle nor pronounce the labial consonants distinctly unless the palsied side of the lower lip be held up by the finger, and if he attempts to protrude the tongue it curves round to the palsied side. The sensation of the paralyzed side is generally unimpaired. Inability to close an eye, or ptosis, usually indicates intracranial disease, while facial paralysis, generally, may be local or peripheral. At times there are intermitting spasms of the facial muscles. In some cases they are confined to eye muscles and simulate a decided wink. At other times they implicate other muscles and give an odd and unpleasant appearance to the face.

A wrinkled ear lobe, with a face seamed with wrinkles, is suggestive of chronic visceral cirrhosis. Here the skin is very dry. A discharge from the ear should always receive prompt and careful attention for various apparent reasons, and especially on account of the fact that chronic otorrhea not infrequently causes meningeal inflammation, sometimes ending in death.

Wry-neck may be temporary and due to cold or rheumatism, or it may become permanent as a result of inflamed glands after scarlet fever or measles. It may also result from disease of the spinal vertebrae, or from the cicatrix of a burn, and from other causes. Enlargement of the thyroid gland may be due to a varicose condition of its blood-vessels, but it more commonly goes with exophthalmos, and it may be found to be a part of Graves’ disease. The arteries of the neck usually pulsate violently and distinctly in aortic regurgitation, and as markedly on one side in aneurism involving the carotid artery. At other times the jugular veins pulsate, indicating regurgitation of venous blood on the systole of the right ventricle with or without tricuspid incompetency.

The respiration may be hurried and shallow, or it may be deep and labored. The first may be caused by nervousness, or it may be associated with pulmonary phthisis. The latter is found in chronic bronchitis and in emphysema. When the deep and labored respiration is very pronounced there is dyspnea and the respiration is both rapid and labored.

The character of the respiration, the pallid or livid countenance, and the anxious look of the patient, usually make chronic bronchitis and emphysema clearly apparent to the educated eye. In pneumonia the breathing is hurried, and the rapidity of the respiration is often the measure of the amount of disease. There is a considerable modification of the shoulders in chronic asthmatics. They are elevated and drawn forward by the pectoral muscles being accessory muscles of respiration, and when they have been much used as such they draw the shoulders forward. In extensive emphysema the chest becomes barrel-formed, but in persons predisposed to phthisis it is quite flat.

In many diseases there is an unnatural fullness of the abdomen, prominent among which are large uterine fibroids, hydatids of the liver, ascites in amyloid diseases of the liver, cancer enlargement of the liver from alcoholism, and, at times, from tympanites. In young children the abdomen is swollen in diseases of the mesenteric glands.

In some women who are subjects of neurosial affections of an hysterical character the fingers are spasmodically closed, but the spasm is usually intermittent. In lead poisoning the hand is often dropped. In hydrocephalus in children it is well to remember that the hand is closed upon the thumb--often very tightly. In chorea the movements of the hands constitute symptoms which aid much in making a correct diagnosis. Chorea may be confined to the hands, or implicate the feet, and, at times, muscles of the trunk.

In describing the "twitch of abdominal pain," Dr. Marshall Bann says:
"In inflammation of the abdomen with severe pain, there is a continued state of concentration of the muscles of the face inducing an unnatural acuteness of the features; the forehead is wrinkled and the brows are knit; the nostrils are acute, drawn upward, and moved by the alternate irregular acts of respiration; wrinkles which pass from the nostrils obliquely downward are deeply marked; the upper lip is drawn upward, and the under one perhaps downward, exposing the teeth."

Many of the facts embodied in the foregoing description of symptoms of disease were taken from the writings of Professors Fothergill and Laycox.

Specific Expressions of Disease and Remedies Indicated by Them.

Many conditions of disease find outward expression through the muscular system and its investing connective tissue and skin, and the physician should recognize them as soon as his eyes have made their examination.

Disease has a voiceless language, and it is this we wish to study, but in order to do so we must get a basis for thought. Commence to think of it and find illustrations in every-day life. The reader will find many such illustrations as he pursues his daily duties.
In acute disease the impairment of life is usually such that the patient assumes the horizontal position, as this requires the expenditure of much less power than any other. In health the horizontal position is associated with rest, and when assumed at unusual times with the idea of debility. Thus the first idea obtained from seeing the patient in bed is that there is impairment of life. It would be a great advantage to the sick if all physicians would keep this fact constantly in mind, and attach such importance to it as would cause them to avoid increasing the debilitated condition by the administration of depressing drugs.

Evidently this fact is one of much importance, and whilst the general expression may not be absolute evidence, it is among the best we have. If, in acute disease, the patient keep his bed all the time, there is considerable impairment of life.

If in ordinary chronic disease we find the patient frequently assuming the recumbent position, and maintaining it for a considerable time, we have to consider it an evidence of enfeeblement, and we husband our patient's strength and employ the class of remedies known as restorative, with appropriate food.

Studying the patient's expression in bed, we find that it gives us additional information. If he lie on his sides, changing his position readily, holds his shoulders and extremities in position, we conclude that the impairment is not great as yet, but if we see him inclined to lie upon the back, or if upon the side that the shoulder falls forward or down, the arm falls and is expressionless, the upper leg and hip show the inclination to fall, and even the soft tissues of the face droop, we are certain there is great impairment of life, and the treatment must be conservative and restorative. In the worst case, where the patient lies continuously upon his back, and is inclined to slip toward the foot of the bed, physicians usually recognize the approach of death.

There can be no mistake about the importance of the inquiry, or the character and certainty of these expressions. If we know the life is feeble, we will certainly husband it, and guard against unnecessary expenditure. If we know the life is feeble, we will be sure to avoid unpleasant and harsh medicines, especially the class antiphlogistic. If we know the life is feeble, we will appreciate the importance of keeping the digestive organs in good condition and giving the necessary food.

If we know the life is feeble, and we have anything in our materia medica that will aid and strengthen it, we will realize the importance of its me.

To determine the condition of rest or unrest is of great importance. When a man or a part is sick, rest is necessary to recovery, and very much of the treatment used looks to procuring rest. The position of recumbence is assumed to get rest, yet we find that many times this is not sufficient. It is well to know that we have to think of this with reference to sleep as when awake, for though sleep usually means rest in health, it may not give rest in disease.

It is well to get an idea of perfect rest in health as a standard of comparison. Observe the child sleeping, and the perfect equipoise of the entire muscular system and the natural position of the extremities show the condition of rest. Even when the child falls asleep in a constrained and unnatural position, the body so adapts itself to it that we have the idea of rest. A group of harvest workmen, taking their noonday rest on the grass under the shade of a tree, will give every shade of this restful expression, and is well worth our study. We learn something here that cannot be told in words, but which serves as an excellent standard of comparison at the sick-bed. Notice the position of a healthy person in sleep, especially how the body accommodates itself to bed and pillows, so that one position will sometimes be maintained the whole night with rest to every part.

Now, when we come to examine the sick the condition of unrest is clearly expressed. The body does not accommodate itself to the bed, and the effort to maintain the position shows itself in the constraint of different parts. We see it in the evident contraction of the cervical muscles to hold the head in position; in the unnatural flexure of the extremities to maintain the body and themselves in position. We have every gradation of these expressions from that which comes some time after the position of the body has been moved, when the patient is tired, to that which is so continuously marked that we know the patient has not one moment's rest.

The position of the body tells us whether the disease is one of excitation or depression, especially as regards the circulation. This also is an important element in diagnosis, and refers us to appropriate remedies. The condition of excitation is marked by constraint and undue contraction. We notice it in the expression of the entire person and of special parts. In the first it has reference to the entire body; in the second it is more the expression of local disease. The ideas that we get are of want of ease and of constant effort on the part of the muscular system to obtain it in unusual and constrained position of one or more of the extremities is quite a common expression. It may be but flexure of one leg, throwing it out or from the body, or a contraction and elevation of one shoulder, or
a prone forearm and hand with marked muscular contraction, or an unpleasant constrained position of the head, with prominence of the cervical muscles, or we may have it in facial expression. Once the mind is directed to it, these features are quickly learned, and, having the knowledge of health, we quickly determine the extent of the lesion.

The evidences of enfeebled function-depression are just the opposite. Whilst in the previous case we have an unusual excitement of the nerves and of the vascular systems, in this we have deficient innervation and impaired circulation. In this there is want of expression; the body lies, so to speak, as if no effort were made to hold it in position; parts fall of their own weight. The want of expression is noticed especially in the subcutaneous muscles and in the skin, giving an unpleasant uniformity of surface and a sodden expression to the soft tissues. Pain, or suffering, is expressed in every portion of the body, and one may learn to recognize it as soon as the eyes strike the body, and yet it would be difficult to describe the expression.

When pain is associated with or the result of undue excitation, the expression will be that just named under this head. But if associated with or the result of an enfeebled condition, either of the entire body, the part suffering or the brain, the general expression may be quite the reverse, and will more resemble the exhaustion that follows excessive grief—one of anguish.

As has been clearly shown by Darwin, expression is most marked in those muscles in most common use, or those associated with mental activity. Thus we would expect to find the most marked expression in the face, and next, probably, in the hands and the extremities. If the reader will think for a moment, he will probably recall distinct expressions in these forms. He will especially recollect the common expressions of pain in the muscles of the orbits and frontal region from contraction of the corrugator supercilii. some of the fibers of the occipito-frontalis, the orbiculars, and sometimes the zygomatic. His attention will only need to be called to the forced contraction of the flexors of the hand during labor, the involuntary expression of pain, and to similar contraction in the feet. Indeed, here is a most excellent study, and one may learn the natural history of pain by closely observing a few labors.

There is nothing like having a familiar example for study, and we may look still further at the phenomena of childbirth. These expressions have the same meaning as in ordinary disease, though here we find them greatly intensified. Possibly we will get as good an idea of rest during the absence of pain in a natural labor as we can get anywhere. And in a difficult labor we will get as distinct an idea of the state of unrest. We observe the pain finding expression in marked muscular contraction of the muscles of the upper and lower extremities and the forced flexion of the muscles of the hands and feet. We also see the expression of pain in the countenance, but in natural labors it is evanescent and not very marked. In difficult labors, especially where the pains are inefficient, we find the constant contraction of the “muscles of pain,” and it is one of the evidences of this condition.

The evidence of local disease will be found in the position of the body with reference to removing pressure from the part or giving it support. This is sometimes so distinct that the attention is at once directed to the affected part. If the position of the body is such as to take off muscular pressure, we conclude that the disease is one of excitation. If, on the contrary, the position is such as to give additional support, we would think of it as being one of impaired innervation and circulation, possibly congestion. A man gives a diseased leg rest in the same manner as a horse. Flexion takes off tension, and if the disease is one of irritation the limb is flexed. Disease of bladder or rectum will be indicated by flexure and crossing of one thigh over the other. Disease of the abdominal viscera, by flexion of the thighs upon the trunk, and probably flexion of the trunk. Disease of one kidney will be announced by flexion of the body on the affected side. Disease of the stomach by marked flexion of the trunk, and relaxation of the abdominal muscles and diaphragm and thoracic respiration. Disease of one lung will be indicated by the flexion of the body on the affected side and the drooping of that shoulder. Disease of the upper lobe of the lungs will be indicated by the falling of the shoulders forward, the additional curvature in the upper dorsal and cervical spine, and by abdominal respiration.

A very natural expression of disease is the involuntary movement of the hand to it. In typhoid fever, when the patient is seemingly wholly unconscious, we find the hand over the bladder in retention of urine, as it seeks the umbilicus when disease of Peyer's patches is marked. The child suffering from disease of the ear involuntarily carries the hand to the affected part. In acute disease of the kidneys the hands are carried to the loins. In some gastro-intestinal disease the hands sometimes go to the mouth, and it seems as if the child wanted to get something out of its throat. It is always well in low forms of disease to carefully watch these expressions, as they give us early intimations of local trouble. And in disease of children, when we have to depend almost wholly upon our own observation, it is also well to carefully observe every expression.
Mental states find easiest expression in the usual channels of innervation, and through those muscles in common use. This is not only true of mental activity, but is also true of disease. There is no disease without a wrong of the nervous system, and it may be added with truth, that there is no wrong of life that is not represented upon the surface through the nervous system.

We may not be able to read it, because our senses have not been trained to observation, and we have not sufficient experience, but the fact that disease is thus expressed should stimulate to study.

The face will show clearly the right life that we call health; and the wrong life we call disease. If one will closely study the expression of the face in health, and compare it with the expression seen in sickness, this fact will be clearly seen. It not only tells us of impaired life, but also of the kind of impairment and of the remedies that will remove the wrong and restore health. It will be well to make a study with reference to (1) the condition of the brain; (2) with reference to the condition of the sympathetic nervous system, and associated spinal cord; (3) with reference to the condition of the circulation and the blood; (4) with reference to local disease; (5) with reference to pain; and (6) with reference to resistance of disease.

The condition of the brain is clearly expressed in the face, and when understood these expressions prove of much value in making a correct diagnosis. Determination of blood is marked by flushed face, unnaturally bright eyes, contracted pupils, and general but moderate contraction of the facial muscles. The expression is one of excitation, and the patient is restless and uneasy. The indicated leading remedy is gelsemium.

Congestion is characterized by dull eyes, dilated pupil, immobile pupils, expressionless face, patient dull, inclined to sleep, and eventually there is coma. The direct remedy is belladonna. In some cases, and when associated with local disease with impairment of the involuntary muscles, ergot. The indirect means are counter-irritation and stimulant cathartics. An intermediate hyperemia, observed in apoplectic conditions, is marked by fullness of the eyes, which arc protruded, fullness of face, prominent veins, and, from contraction of the platysma, a drawing down of the face and angles of the mouth. For this condition the direct remedies would be veratrum viride, ergot and apocynum.

Inflammation is marked by still greater contraction of the muscles, especially those of the orbits and the frontal region, the deeper flushing of the face, the sharper expression of the eyes, which are dry and pinched, the contracted pupils, and as the life is impaired, by the appearance of constriction of all the tissues around the base of the brain. The direct remedies in the first stage of an inflammation of the brain arc the proper sedatives, such as aconite, veratrum, Gelsemium, and ferrum phosphoricum. These may be followed and aided by such as increase the action from skin, kidneys and howels. The indirect remedies are such as may call the excitation to other parts.

Effusion is marked by the dullness and finally by coma. The eyes lose their sharp, bright expression and become dull; the muscles of the lower part of the face relax, as do the muscles that move the inferior maxillary and the mastoid. If the irritation still continues, the contraction of the orbiculars and frontal muscles persists, and the evident constriction or pinched appearance around the base of the brain becomes more prominent.

If the irritation passes away with the effusion, these muscles gradually lose their power, and the upper part of the face assumes a dull, sodden appearance. The direct remedies are small doses of aconite and belladonna, alternated with apocynum and bryonia. The nutrition of the brain is not so easily determined, yet we may reach correct conclusions in the majority of cases. The enfeebled nutrition will be marked by a want of expression, especially in the mouth, showing a want of decision. The eyes may have a normal appearance at first sight, yet as we watch them uncertainty is shown in their movements. In some cases the expression when the patient's attention is not attracted is very like that which follows exhaustion from excessive emotion.

Softening of the brain, so called, will be marked by a smooth, placid countenance, the want of expression in the forehead being especially marked. In some of these cases the tissues have their ordinary fullness, and sometimes the soft tissues of the face are unusually full, yet they look soft and flabby, and hang in unnatural folds.

Atrophic irritation of the brain is marked by the pinched and uneasy expression of the upper facial muscles, the muscles of the orbits and frontal region. The patient holds his head in a con-strained position, frequently inclined to one shoulder, and the face turned to one side, giving the eyes an unpleasant expression of obliquity. The elevation of one eyebrow and the falling of the other, with an apparent divergence in the axis of the eyes, will locate the lesion in or near the cerebellum.

The evidences of structural disease varies with the situation and character of the lesion. They may be divided into irritative and atonic, the one showing market! contraction of some muscle or muscles of expression, the other a want of contraction, and consequent fullness and drooping. Sometimes in the severest structural disease there is no external expression.
The functional activity is very clearly shown in facial expression, and we will observe the entire range from normal function to furious delirium on the one hand, and to entire loss of function and conscious life on the other.

Activity is not only shown in muscular contraction, but in alternate contraction—the play of the emotions of the muscles. This change of expression is one of the most familiar examples of mental activity. In delirium we observe that the play of the muscles is exaggerated, as indeed is the expression of all the emotions. This is especially noticeable in the expression and movement of the eyes and their external muscles.

Want of activity is expressed by want of contraction of the facial muscles, dull, immobile eyes, and full lids. The condition of the sympathetic nervous system is pretty clearly shown by the eyes, the orbital muscles and the tissues about the base of the brain.

The disease of irritation is shown by the contraction of the tissues which form the bed of the eye, the retraction of the eye, especially upward, the thinned and constricted eyelids, and the tissues about the temples. In some cases the pinched or constricted alae nasi is a marked feature. The disease of atony is shown by the full, expressionless eyes, fullness of the lids, pallid and waving alae nasi, and fullness and want of expression about the mouth.

A temporary want of sympathetic innervation that is rectified by podophyllin in very small doses is shown in the fullness of all the tissues of the face, especially the upper portion, and by fullness of the veins. For the disease of irritation ipecac, bryonia, aconite, rhus tox., muriatic acid and nitric acid are suggested, the selection being made by the other symptoms present. Temporary relief is obtained by the local application of chloroform before and behind the ears, and over the first cervical ganglion. The chloroform is so applied as to prevent evaporation and a change in the pulse will usually he noticed in a few minutes from it, first application. and the relief is marked, and very frequently it lasts for some time.

The disease of atony is met by nux vomica, avena, cyprepedium, crataegus, minute doses of podophyllin, phosphorus and the bitter tonics.

Whilst the expression of the face will give us pretty accurate information with regard to the circulation, we may obtain this information more directly elsewhere. If the cellular tissue is full, we think of veratrum. If it is shrunken. aconite. If the expression of the eyes and associate muscles is dull, with fullness, we think of capillary congestion and belladonna. If the cellular tissue is full, the face expressionless, and the veins prominent, podophyllin. If the eyelids are especially full, apocynum. If the eyes have a pinched expression, dry in acute disease, secretion of tears in absence of fever, dry, shriveled epidermis, flushed left cheek, rhus tox. Right eyebrow drawn down, and expression of eye changed, flushed right cheek, bryonia. These are the most prominent examples, and in each case there is a wrong of the circulation, which may be the predominant wrong. At any rate, the remedies thus indicated will prove curative.

With reference to the condition of the blood. we may find more direct expressions than in the face, yet these arc not unimportant. The sodden tissue evidences poor blood and poor nutrition, as the firm elastic tissues show good blood and good nutrition. The typhoid condition of the blood will be clearly shown in the contracted and opaque skin in the one case, and the sodden inelastic tissues in the other. Pyemia will show itself first in the marked contraction of tissue about the base of the brain, sinking in of the bed of the eyes, and especially by retraction in the upper part of the orbit.

Some local diseases are clearly indicated by facial expression. Disease of the respiratory apparatus will be shown by the expression of the nose and accessory muscles. The lesions of irritation by contraction, the lesions of atony by relaxation. Any one who has watched the progress of an acute inflammation of lungs, of pleura, or of bronchia, with irritative cough. must have seen the pinched expression of the nose, and the contraction of the alae.

So marked is this, that sometimes it seems to precede the trouble, and will be marked before the disease of the respiratory apparatus has full development. The relaxed and waving alae nasi gives an unpleasant impression of disease, and as before named, has reference to the lesion of innervation as well as to impairment of the respiratory function.

The expressions of the mouth are associated with disease of the abdominal and pelvic viscera. Let us take the familiar examples of intestinal forms as an illustration. The full upper lip, with pallor, the white lines around the mouth and picking the nose is the most pronounced evidence of ascaris lumbricoïdes.

This worm inhabits the small intestine and the conditions present are atony of mucous membranes, with impaired function, and increased secretion of mucus. and at once we think of the associated symptoms and the intestinal wrong.

The remedies will be those which will give normal stimulation to the structures involved-
podophyllin, santonin, some of the mild cathartics, the stomachic bitters, and sometimes the alkaline salts or acids, as may be indicated by other symptoms.

If fullness in this case means atony and impaired function and increased mucous secretion, it must mean it always, and we will always think of such remedies as will influence the small intestine and associate viscera, giving normal stimulation and circulation and restoring functional activity. There is a peculiar expressionless mouth, or an expression of "loss of spirits," with a little depression of the angles of the mouth that invariably means nux vomica.

Nausea is shown by depression of the angles of the mouth and slight incurving of the lower lip. If the tissues are full, we know that there is atony; if pinched and shrunken, that there is irritation and determination of blood.

Contraction of the orbicularis oris is usually found in some diseases of the reproductive organs, especially of the female. In chronic disease, there is distinct retraction from the other muscles of the face, and the entire tissues seem thinned. In some of these cases the zygomatic muscles are also prominent.

Pain and suffering are distinctly expressed in the features, yet not always in the same way. Firm contraction of the muscles is the most common expression. Thus every reader will recollect the contracted brow as evidencing pain, especially pain with irritation of the nerve centers. We involuntarily associate contraction of the structures about the eyes and the wrinkled skin with pain or with suffering. But we have the evidence of pain in this region without muscular contraction; indeed, there is the reverse, drooping of the tissues, the expression is sad, of the exhaustion that follows excessive grief, and we are assured that there is enfeebled circulation in the brain and the pain is the expression of atony.

It is very important to make these distinctions in order to select remedies. Pain is the result of two very opposite conditions—an excited circulation and an enfeebled circulation. In the one case we use gelsemium, the sedatives, salines, rhus, macrotylus, or bryonia, as may be indicated. In the other we use quinine, nux, stimulants and tonics, pain in the abdomen, pelvis, or lower extremities, finds expression in the mouth. Acute pain almost always finds expression in contraction of the mouth; when very severe the lips are firmly drawn in, the angles of the mouth retracted and somewhat depressed.

In some other cases the angles of the mouth are drawn in, and there is that action of the muscles of the upper lip that gives it and the checks a full expression.

Some patients resist disease by an influence of the will, and sometimes this effort is very important. Others yield to it from the first, and thus favor its progress. Everyone has made these observations, and will recognize the importance of knowing whether a patient resists or yields, as it may determine whether he will recover or die.

An eminent author has said that the firm closure of the mouth tends to give an expression of determination or decision to the countenance. No determined man probably ever had an habitually gaping mouth. Hence, also, a small and weak lower jaw, which seems to indicate that the mouth is not habitually and firmly closed, is commonly thought to be characteristic of feebleness of character. A prolonged effort of body or mind implies previous determination; and if it can be shown that the mouth is generally closed with firmness before and during a great and continued exertion of the muscular system, then, through the principle of association, the mouth would almost certainly be closed as soon as any determined resolution was taken."

It is important to know whether the patient is inclined to resist disease and is determined to get well, or whether he is yielding, despondent, hopeless. The firm mouth means that the patient will get well if he can. The relaxed, drooping mouth, fading jaw, trembling muscles, show us the need of giving the patient courage and strengthening the will power. It also shows the necessity of increased care to conserve vitality, and of the employment of restorative remedies.

We not only find disease expressed in position, and in persistent muscular contraction, as heretofore named, but it is also shown in motion. We see a man standing or sitting, and observe that his soft tissues seem to resemble a badly fitting suit of clothes, and we think at once of impaired nutrition and degeneration of tissue. But it may be only a want of innervation, from habitual torpor of the nervous system. Set him in motion, and we will soon see whether this is so or not, for there are none so sluggish in this respect but what they may be aroused.

We notice the movements of the person that we may confirm the diagnosis of expression, especially as regards the important point of undue irritation and circulation, or impaired innervation and circulation. The quick, restless movement is characteristic of the first; the desire to lie still and the slow movements, of the second. Possibly there is no evidence of disease more definite than this, and it should be allowed its full weight in diagnosis.
In some cases the rapid movement is but a means of removing excessive excitement of the brain and spinal cord, as in great grief or joy, or in case of severe but temporary pain. In such cases it may be looked upon as a means of relief, for if the excessive emotions or pain were pent up, the person might suffer severely from it, not in other case whilst it tells of nervous irritability, the bodily movements give no relief, but even intensify the wrong, besides causing exhaustion. In these cases we endeavor to get bodily rest from the first, as a means of allaying the nervous excitation. Everyone will have noticed the influence of the physician, nurse or friend, who with kindness but firmness insists on keeping still. The hand placed upon the body of the sufferer to give support, seems to strengthen the will power, and frequently with an effort on the part of the patient comes rest and relief.

There is a case of restlessness from an enfeebled and atonic condition of the nerve centres that requires notice. The unsteady movement, or the evidence of exhaustion following it, with the anxious, depressed countenance, tells the story. In the other case we will find almost continued tension of the muscular system.

Whilst in the case of irritation and determination of blood we would employ the sedatives, with gelsemium, or remedies exerting a like influence, in that of atony we would use nux vomica, phosphorus, kali muri., avena, cactus, eupatorium aromat, and quinine.

Increased movement is not associated with structural, or even with severe local functional disease, so that unless it points to a wrong of the cerebra-spinal centers we do not regard it as an unpleasant symptom. In ordinary colic the patient is restless, and seems to get relief from motion, but in the severer forms of colic called "bilious," and in acute enteritis, he remains very still.

In local disease the patient favors the affected part in movement. Frequently the first evidence we have of morbus coxarius is the care shown in moving the leg and placing the feet in walking, and the elevation of the hip to remove pressure from the joint. Turning the toes inwards, both in movement and rest has the same signification. One can readily distinguish a wrong of the pelvic viscera by the movement of the hips and extremities, showing the constant effort to prevent stress or pressure of the parts. This will be noticed in some uterine diseases, (irritative), as well as in displacements. In chronic disease of the kidneys a forward curvature of the spine is frequently marked, and the patient is observed to put the bands upon the hips in rising from the chair, and sometimes in walking. If but one kidney is involved, or the liver or spleen, we observe the slight flexure to one side, and the effort to save the part from the movement of muscles. Evidently the drawing forward of the shoulders-"winged scapula"-is a symptom of similar import so far as the lungs or thoracic region is concerned. So certain is this that with the marked falling forward of the shoulders and separation of the scapulas, one may be sure there is some disease in the thorax. The head drooped forward has a similar import, though this is sometimes an indication of a wrong of the sympathetic nervous system.

In irritative disease of the cerebrum, or of the organs of special sense, the head is flexed, but in disease of the medulla oblongata, cerebellum, pons and crura, the head is drawn backwards. Forced extension, or head drawn backward, will be recollected as a prominent symptom in cerebro-spinal meningitis.

In all these cases flexion and favoring the part in muscular movements are evidences of irritative disease, and indicate the treatment. First, remedies that influence the affected part; and second, remedies that remove excited innervation and circulation or functional activity.

In another class of cases we find flexion from or opposite the affected part, and the position of the body and muscular motion are such as to give support and moderate pressure. The evidence in this case is of impaired circulation. congestion, effusion and enlargement. It is safe to say that in the majority of these cases the remedies will be such as will give additional stimulus.

If one will closely observe the movements of the abdominal muscles, they may determine conditions of disease in pelvis or abdomen. The careful, slight movement evidences disease of the pelvic viscera, if especially marked below; the chylopoietic viscera, if especially marked above. The full abdominal walls, with sluggish movement, evidences atonic disease and congestion.

If we examine with reference to the thorax, we will find that free movement of the abdominal muscles and diaphragm, and but slight movement of the upper thorax, is evidence of disease of the upper lobes of the lungs. On the contrary, thoracic respiration, with but slight and careful movement of the abdominal muscles, evidences disease of stomach or liver.

We have already examined the expression of the face sufficiently, and the movements of the muscles do not give much additional evidence. Twitching of the muscles is an unpleasant expression, and indicates undue spinal irritation or irritation of the basilar brain, the cause being frequently extrinsic. If of the mouth, our attention is directed to the abdominal organs; if of the upper lip and face, to the stomach; if of the nose, to the lungs; and if of the eyes and forehead, to the brain and spinal cord.
The quick involuntary movement of the eyes refers us at once to the excito-motor nervous system, and at once we make an examination to determine the source of the lesion, its cause, and adopt means to prevent its further progress, and convulsions.

The forced contraction of one of the muscles of the eyeballs, turning them upwards, downward, to one side, or causing strabismus, evidences disease of the brain, which may or may not be associated with wrong of the spinal cord. The character of the disease may be determined by the expression of the eyes and associate muscles, or by other symptoms. In diseases of children we will notice that sudden contraction of muscles and movements of parts is a precursor of convulsions. The quick movement of the hand, with contraction of the fingers, the quick movement of the lower extremities, with forced flexion, or the quick movement of the head upon the pillow, or the sharp, jerking movement of the shoulder, should never be neglected.

Color is of much importance in diagnosis. The hue or color of the part being examined should, therefore, always be carefully observed. Color in man has two sources—from the blood and from the pigment—and it is well to differentiate these. In the first case the changes of color are referred to wrongs of the blood; in the second they are referred to changes in the quantity or character of the pigmentary matter of the body. A simple division would be into color which has red for a basis, and color which lacks red, is a shade of yellow, brown or black. In making examinations with reference to the blood, we select parts where the circulation is free and the epidermis or epithelium is thin—where the skin is thin and the mucous membranes delicate. We examine the nails, the lips, the cheeks, the hands, sometimes the feet, the tongue, and mucous membranes of the mouth.

What is the color of health as shown from the blood? It is rosy, a light shade of carmine and lake, and is clear, transparent, and offers no darkness or admixture with blue, purple, or brown. As the finger is pressed upon the surface, or pressed over it, toward the heart, the rosy color is removed, leaving the structures clear and transparent, but the color comes back quickly when the pressure ceases. It is difficult to describe color in words, but if the reader will now make his examinations of health he may readily learn to distinguish the color of health.

The shade of rose color in mucous membranes differs somewhat from that of the skin, because it is modified to some extent by the pigment in the rete mucosum. It is well to get a clear idea of it by examination of the lips, the tongue, the mucous membranes of the mouth and fauces. The color of mucous membranes is quite changeable to a slight degree, even in health, having shades of blue, violet, white, probably from the secretions of the mouth and the food and drink; and we never regard these slight variations as diagnostic.

The pigment color of health varies in different races and in different individuals. But if we say it is somewhat transparent and clean, we may express its character for all races. If we take a negro, for example, we will find that the jetty black has a transparency and cleanliness—glossy and smooth, which will be readily recognized. Let this man become sick, and the color grows dingy and opaque. If we take the olive or brown skin, the same cleanness and dearness of color is marked, and it seems so transparent that you may almost look into the skin.

If you take the Caucasian, the brunette will show the same cleanness in the skin pigment, and in the healthy blonde it seems as if you could look quite through the skin, it is so transparent. We may well notice these peculiarities in the color of the hair, as it shows health and disease like other parts, but modified more by local conditions.

In studying color, especially that given by the presence of blood, it is well to note that it may be changed in quantity (so to speak) and in kind. Change in quantity has reference to an increased circulation and an increased amount of blood in the capillaries; change in kind, to the condition of the blood.

Simple excess may be noticed from any cause increasing the circulation to the surface or to a part. We observe this excess of color in slight acute diseases, where the activity of the heart is increased and there is general vascular excitement. If a part of the surface shows this excess, we at once think of its relation to internal organs and functions. If of the upper portion of the face and eye, we order the wrong to the brain.

If of the cheeks, one or both, we refer it to the respiratory organs or apparatus of circulation. If of the month and lower part of the face, we refer it to the abdominal viscera.

As the excess refers to vascular excitement, and mean: "general sedatives, so these local excesses mean local vascular excitement and local sedatives if we have them. Thus for the brain it would mean gelsemium; for the thoracic organs, veratrum; for the abdominal viscera, aconite, ipecac, etc.

It is well to note the condition of the capillaries in this examination, and we may determine somewhat of their condition by the effects of pressure. If the capillaries are in normal condition,
pressure should efface the redness, but it is but momentary. If the finger is drawn across the reddened surface, we notice the white line made by displacing the blood, but it rapidly passes away, and the blood flows quickly in and fills the vessels. If now we examine the redness in scarlet fever in the same way we will find that the finger carried over the part with pressure effaces the redness and leaves a distinct white line, more or less persistent, as the fever is severe.

This shows enfeeblement of the capillary circulation, especially from the arterial side, and is an indication for belladonna. If the capillary wrong is from venous obstruction, the color will be deeper, and the wrong will be associated with fullness of cellular tissue in many cases, and the white line made by pressure is not so clear. In this case bryonia and podophyllin are indicated remedies.

We not only find an excess, as above named, but in other cases a detect in color, showing poor blood, leucocythemia, or an impaired circulation to the surface. The pallor of anemia is shown in all parts of the body, and is associated with evidence of impaired nutrition. In the rare pathological condition, leucocythemia, there is sometimes marked pallor, but usually it is disguised by increase or change in the pigment of the skin. In deficient circulation to the surface we have want of color but no evidence of want of blood in totality, or impaired nutrition.

Deepening of color-dark red-is usually associated with zymosis, and has reference to sepsis of the blood. It is associated with ashenia, and when observed it tells of impaired function. But it especially shows the need of acids, and in this respect refers to a direct remedy. It makes no difference where we find it most marked, its meaning is quite the same, of course modified to some extent by local disease.

If the reader will think for a moment of the cases he has seen presenting deep redness of the surface, he will recognize the truth of these statements. In typhus fever the gravity of the disease shown by the flushed skin-dark red. If in small-pox we find the skin assuming this dark-red color, we are confident the disease will be severe, showing depravation of the blood and marked ashenia. If we observe it in measles, we anticipate trouble from tardy appearance of the eruption, depravation of the blood, respiratory trouble and impairment of function. If seen in pneumonia, it talks to us of approaching "typhoid symptoms," of a low grade of inflammation and great prostration. So clear is the evidence, and so rare the exceptions, that it becomes one of the most reliable evidences of disease we possess.

The meaning is modified to a certain extent by the results of pressure—whether the color is solid and unyielding as the finger is pressed over the surface—or whether it is effaced by such pressure as heretofore named in simple excess. In the first case it has reference wholly to the lesion of the blood, in the other in part to the lesion of circulation—at least the evidence is less grave.

The dark redness is an evidence of sepsis and an indication for antiseptics. In such cases strict cleanliness must be observed and good ventilation secured. Proper means must also be employed for disinfection.

If the dark-redness is associated with ashenia and impairment of life, and gives us timely warning of such impairment, it will caution us against the use of all depressant remedies, or anything that will impair any of the important functions of the body.

And it suggests the necessity of keeping the stomach in condition to receive food, and the proper selection and preparation of food during the progress of the disease. But it directly refers to acids as remedies, and this is of much importance. Acids here are the antiseptics and antizymotics, and muriatic acid is the indicated remedy.

The dull purple (bluish) of venous blood has reference to imperfect venous circulation and imperfect decarbonization of the blood. It may be caused by disease of heart or lungs; if not, we recognize a lesion of sympathetic and associate spinal nervous systems. It evidences an unpleasant condition of life, and one that should be remm. cd if possible. In some cases the dullness of color becomes so marked that we designate it as leaden.

If we find local structural disease to account for it this will receive our attention. If it is sudden and associated with precordial suppression and constriction of the chest, lobelia and echinacea will prove useful. If less marked and chronic, we will think of cactus and pulsatilla. In acute cases chloroform counter-irritation around the lower margin of the thorax gives speedy and marked relief.

In the lesion of cholera we will find the blueness of hands and feet dependent upon enfeebled capillary circulation, the blood being loaded with carbonic acid gas. If the condition of the blood can be so changed as to enable it to circulate, this passes off. This blueness with pallor is one of the most marked indications for natural muriaticum.

Want of color, with a shade of solid blue where the blood shows freely, as under the nails, the lips, the cheek and thin-skinned portions of the body, may be assumed to indicate the want of iron. Ferrum phosphoricum constitutes a pleasant form in which to supply this want. A violet tint with
increase of redness, uniformly or only where the circulation is superficial is a prominent indication for nitric acid. Deep color, with purplish brown or black tinge, is a prominent indication for baptisia.

Color not deep, but muddy or dirty, of parts freely supplied with blood, is an indication for sulphurous acid. If there is this dirty shade with pallor, we would use sulphite of sodium.

When we come to study the local changes of color referred to the blood, we divide them into two classes, the one in which the change is to be referred to a lesion of some other part-sympathetic; the other in which it is dependent upon local disease. The reader will notice that the significance of color must depend very much upon this, for whilst the one may have no reference to the condition of the blood at large, or to any structural lesion, the other is wholly referred to the lesion of the structures and to changes in the blood.

We always want familiar examples to show that a method of study is likely to prove advantageous—that is, a basis of fact and we will adduce the three familiar cases of change in the color of areola of the nipple, the dark line under the eyes in certain conditions of women and the white line around the mouth in some intestinal diseases of children.

Every practitioner will have noticed the darkened areola of the nipple as an evidence of pregnancy, but may not have had his attention called to it as an evidence of disease of the reproductive function. In wrongs of this function simulating spermatorrhea we will find this change of color marked, as we will in scanty menstruation with congestion and in hypertrophy of the cervix uteri. Of course, we do not look for this except in the diagnosis of pregnancy, but in this case it is one of the most valuable symptoms.

If you should notice the deep color under or around the eyes in women, you would say at once there was a wrong of the reproductive organs or function, and you would rarely make a mistake.

If the tissues seemed dry, the eyelids shrunken and contracted, it would be safe to say that the disease was one of irritation, and would probably be relieved by pulsatilla and macrotys (especially if functional).

If the eyelids were full, swollen, relaxed, that the disease was of congestion or atony and would be benefited by hamamelis, apocynum, staphysagria, phosphorus, iron, etc.

If one should notice the white line around the mouth, with full pallid upper lip, full or contracted mouth, he would at once refer the symptom to a wrong of the gastro-intestinal apparatus. The reference is undoubtedly right if we except the rare case in which the symptom is dependent upon lesion of the brain. In wrongs of the stomach and bowels, if the structures are full, the abnormal condition is likely to be one of atony—a want of innervation and a sluggish circulation. If the structures are constricted and pinched, the wrong is very certainly one of irritation, excited innervation and circulation.

It is worth our while to carefully read the evidences of disease in the patient's face, especially when the indicated remedies are suggested by such reading. The white line around the mouth is an evidence of gastro-intestinal disease, and if there is fullness of tissue, podophyllin, hydrastis and santonin can be employed with advantage; but if the tissues are contracted, and there is thinning of structures, aconite, ipecac or gelsemium may be required. If we notice a peculiar bluish or leaden tint to this white line around the month, and see a slight dragging down of the corners, we would recognize a gastro-intestinal lesion which usually calls for bismuth, but sometimes minute doses of arsenic.

Increased color of cheeks has been known as a symptom of thoracic disease for thousands of years, but the nervous and vascular relations to this flushing of the cheeks are not easily explained.

A constantly recurring flush of one or both cheeks has reference to an irritable or diseased lung. The persistent high color, even though it be a distinctly circumscribed spot, has a different meaning. If we notice this circumscribed flushing of the cheeks, our attention is at once at traded to the respiratory apparatus.

Associated with frequency of pulse and increased temperature, it tells us of commencing tubercular deposit. In this case the one cheek is usually flushed. It may be remarked, further, that this symptom is always associated with a wrong of the sympathetic nervous system, especially in its relation to circulation and nutrition, and in phthisis we only find the bright, flushed cheek with irritation. Sometimes there is quite as marked pallor, and the evidence would be a want of innervation, The bright-red flush of left cheek in acute disease is usually referred to thoracic disease, but does not always indicate it. It evidences a lesion of sympathetic and spinal innervation, but is especially valuable as calling our attention to rhus tox. as the probable remedy.

The deeper flush of right cheek is more frequently seen in disease of serous membranes and fibrous tissues, but is especially valuable because it points out bryonia as the probable specific remedy.

The bright color of the cheek, where it has reference to disease of the respiratory organs, tells
us of irritation and activity of circulation, but the deep color indicates impairment of the circulation and of the life. The livid, purplish color in some cases of angina pectoris may be taken as the type. We have it in much less degree in thoracic ancurism, in apoplexy of the lungs, and in some very severe cases of asthma with con-gestion. The dark redness is always evidence of a difficult and imperfect circulation.

There is a pinkish color of parts freely supplied with blood that is regarded by some as an unpleasant symptom. As this color becomes more pronounced, we observe it in the veins as well. In women we may usually regard it as an indication of a menstrual wrong, which is likely to be corrected by the use of pulsatilla, actaea alba, helonias, phosphorus and the hypophosphites.

Cutaneous veins in children which are prominent and show a constant and distinct blue line are a marked indication of feeble vitality and should prompt us to advise an abundance of outdoor exercise, good blood-making food, and that such children should not begin study early or be much confined until there is a stronger and more robust life. Unusual blueness of veins is a good indication for iron.

If associated with pallor, the acetate of iron will be the indicated remedy, but if there is a deep color of the tongue the tincture of the muriate of iron should be employed.

The color of the conjunctiva and sclerotic will sometimes give us information in regard to the circulation of the brain. If find an injected conjunctiva (not the result of local disease), We conclude that the cerebral circulation is similarly affected. If the color is bright and the surface looks smooth and moist, we have evidence of determination of blood. If the color is deep and the surface looks dull and dingy, or dry and pinched, it represents hyperemia with obstruction to the return of blood-the apoplectic condition. The dull, colorless eye is the best indication for belladonna, though we use it when the eye is injected with tortuous vessels.

In superficial disease the color of the part is a means of determining its condition. If we take the ordinary symptoms of inflammation, increased color-redness-is one of the first named as constant. Given increased color with heat, pain and swelling, and we say there is inflammation. Of these, color will best give us the real condition.

If the color is bright, healthy red we know at once that the inflammation is simple, and is not very likely to work a very great wrong to the part, or to the body at large. It tells us of irritation, determination of blood, and of the activity of circulation; the second part of the wrong of circulation-stasis-is in but small proportion. In this condition general and local sedatives must be employed to get rid of the increased heat and establish secretion. The evidence is quite the same, whether we are looking directly at the inflamed part or at some distant surface that it influenced by sympathy.

If the color is deep-red and dull we are confident there is marked impairment of life and arrest of circulation. The fact is evident that there is too much blood in the part. that the capillaries are enfeebled, and the circulation in them is sluggish or arrested, that change has commenced in the stagnant blood, and that the life of the part will be destroyed unless these wrongs are corrected. To this case the circulation must be strengthened, the frequency of the pulse lessened and the life of the blood conserved and sustained by rest and food. If a local application is to he made it is now stimulant-we want to strengthen the life of the part. If we select an internal remedy that is to influence the part from the blood, this remedy must be stimulant or tonic in its character.

If the part assumes a blue or purplish color we recognize venous stasis and an obstruction to the circulation from the part. With our attention called to the nature of the wrong we will find its cause and remove it if possible. In some cases, the wrong being general, venous impairment is cardiac. We do not know why, but we rarely find an impairment of the right heart when the left is sufficient for the systemic circulation. Crataegus and echinacea will exert a very favorable influence in these cases.

If there is fullness of cellular tissue apocynum may be associated with it or given alone. If the wrong is from venous impairment and is chronic. hamamelis is probably the remedy.

The erysipelatous redness is so distinctive that being once seen it can hardly be forgotten. The vivid coloration, evident dryness, shining appearance, give the beholder a sense of burning. It makes no difference so far as the significance of this coloration is concerned whether we have the local inflammation of the skin or not; it refers us to a lesion of the blood zymotic in character. If the surgeon finds this tint of vivid redness on the edges of a wound or the flaps of an amputation, he would at once be on the alert to get rid of the lesion of the blood. If the physician observed this erysipelatous flush on the check in inflammation of the lungs, or anywhere on the surface during the progress of an inflammation or fever, he might feel sure he would have a more than usually serious case to manage.

We may distinguish four shades of this erysipelatous redness, quite well marked in many cases, pointing out the remedies for the disease of the blood and the local inflammation. In the first the redness is quite vivid, and the edges of the local disease show a simple erythematous flush, and the part...
does not look dry and constricted.

Sometimes there is arterial throbbing of the part and the pulse is full. In this case veratrum is the general and topical remedy. In the second case the redness is very vivid, and the parts dry and constricted, with sometimes the appearance of a slight pustular eruption. The pulse is small, sharp, vibratile; the remedy is rhus tox. In the third case theredness has a deeper shade, sometimes vivid, sometimes dull. The remedy, both general and local, is tincture of muriate of iron.

The fourth case shows more or less of a blanched appearance as the disease advances—sometimes in the center, sometimes at the borders, sometimes of the deep structures—you seem to be looking through the superficial redness. In these cases the general remedy is sulphite of sodium, the local remedy sulphurous acid, permanganate of potassium or phenol.

The variations of pigment color in different individuals is so great in health that it might seem almost impossible to get definite information from its variations in disease, yet we will find it is quite as certain as other evidences of disease. Of course, we must have a correct idea of normal pigment coloration and some guide to the natural tint of the individual. Transparency and cleanness are the characteristics of health whatever may be the shade. The lesions might be divided into those of excess, defect and perversion, though the last is the most important.

Excess of pigment, when it retains the cleanness and transparency of health, is usually evidence of active life and good nutrition and excretion. Of course, outdoor exposure is always taken into consideration as causing an increase of pigment. Local excesses of pigment have a variable meaning, though if still clean and transparent we think of functional activity. If we take the areola of the nipple, the clean, transparent, deep color evidences healthy gestation, as does the deepened color over the gland. The increase of abdominal pigment has the same meaning, as has the increased pigment color of the vulva.

Even the increased pigment of face observed during gestation is an index of healthy function. Not so the unequal and unpleasant brownish coloration known as morph.

The deep pigment coloration of the neck in brain workers is a sign of healthy nutrition of the nerve centers, whilst the want of pigment would indicate anemia, and the dirty pigment would show a wrong of nutrition.

The coloration of the skin and hair have the same associations. The clear, transparent color is the evidence of health, especially of the skin. The deepened color is evidence of an active life, especially of the vegetative functions: whilst a loss of color is at once referred to impaired nutrition. Even the color of the hair is subject to slight changes, and one may learn to distinguish by this the condition of the nutritive function. It is an unpleasant sign to find the hair becoming dull and sickly in color.

There is an increase of pigment distinctly brown and in patches on various parts of the body which is known as "liver spots." They generally make their appearance on parts covered by the clothing, and may be quite large and extensive. We refer them to a wrong of the bile pigment, and frequently find it associated with a wrong of digestion and impairment of the function of the brain. The remedies indicated are podophyllin and hydrastis.

The brownish-yellow coloration is evidence of a wrong of the organs of digestion. We may find it only about the mouth or the face, or we may find it pretty general where the lesion is chronic. It refers us to nux vomica as the remedy.

Give us the same color, but dull and opaque, or with a leaden tinge of adjacent skin and we again refer it to a lesion of the organs of digestion. The remedy is chelidonium: podophyllin if the tissues show more than usual fullness.

The bright yellow of jaundice is a symptom of wrong of the liver. What the condition of the liver may be other symptoms must decide, but in so far as the color is concerned, we expect to wash it out through the kidney. Chionanthus and kali muriaticum are the needed remedies.

There is a peculiar sallowness with a tinge of green that indicates great impairment of blood-making and nutrition. The remedy is copper.

No one could mistake the opaque, tallow-like color of hypochondria and associate states. It tells us of impairment of the digestive and blood-making organs of nutrition and of waste and excretion. There is a slow renewal of life, and the tissues are old and feeble. Very clearly in this case we want a more active "renewal of life," and we stimulate the processes of retrograde metamorphosis and excretion on the one hand, to remove the old structures and, on the other, we see that the function of digestion is well performed that we may have increased nutrition.

One could hardly mistake the evidence of the dingy, dull, grimy, dirty color of skin. It refers us
to a wrong of the blood, "bad blood", and we conclude that the blood is as dirty as the skin. Of course, it would not do to mistake the dingy, dirty skin which may be caused by a lack of cleanliness. In cases presenting this dirty color of the skin remedies to increase secretion, and sometimes to promote retrograde metamorphosis, hold the first place, though we do not forget the importance of improved nutrition.

There is a deepened tint of skin, dull and opaque, that is a very good indication for arsenic or phosphorus. The tissue seems to have lost life and is inelastic. Dullness of color and opacity may be regarded as the special features, and opacity where the color is lighter than usual may indicate the remedy.

If we have a distinct want of pigment, the want of color not dependent upon anemia or an enfeebled circulation of the blood, we think of sulphur as a possible restorative. Given in small doses, we sometimes find it exerting a marked influence upon the nutritive processes.

The color may be deepened in plethora and in the gouty heart with atheromatous arteries, causing the face to become very red. When the face is purplish there is venous congestion. This is seen in mitral disease, in dilatation of the left ventricle, in cases of embarrassment of the pulmonic circulation and in all cases where the right ventricle is overtaxed. As in cyanosis in babies, it indicates congenital malformation or imperfect development of the heart. Purplish congestion of the face, with hurried respiration in pulmonary phthisis, indicates much invasion of the lungs, and makes for a most unfavorable prognosis. An increase in the natural vascularity of the face, with a certain "blurring of the arteries" of the face, a fullness of the lips and alae nasi, is found with organic changes in the heart in young patients, generally indicating mitral disease. It is also seen in some women at the time of the menopause, when they are not so well as usual, and there is a certain amount of vasomotor paresis with low arterial tension. By a careful observation of the features these cases may be differentiated. Circumscribed redness of one or both cheeks, with abruptly defined borders, is a diagnostic symptom of acute pneumonia. If it exist in a case of chronic pulmonary disease it denotes the so-called hectic fever and is a sign of phthisis. There is a peculiar blueness of the nose, lips and the skin over the cheek bones which is seen in some persons who habitually use chloral. It is a color unlike any other. The same hue may be seen on the hands of persons addicted to the drug.

Cases in which pallor is a very prominent characteristic are often seen. There is simple pallor due to anemia, whether caused by malassimilation or defective food, or by a drain on the system, as in diarrhea, menorrhagia, with or without leucorrhea, repeated epistaxis, or loss of blood from any cause. The color is more cachetic-looking, approaching the cancerous character in some cases of gastric ulcer, producing a marked waxiness. The cancer hue is slightly yellowish, yet distinct enough usually to be easily distinguished. In Bright's disease there is marked pallor, with unnatural smoothness of the skin in some cases, as, for instance, in the case of middle-aged ladies or comparatively young men. In the older person the skin is wrinkled more than is natural for the age. In both cases it is abnormally dry and perspiration is not easily excited.

There are cases of anemia in which the skin looks like parchment, much as if the subcutaneous fat had been absorbed and the dry skin tightly drawn upon the solid understructures, bringing out the temporal artery, usually tortuous, in strong relief. This condition has been observed in spare young men with syphilis and in spare old people with visceral cirrhosis. In the latter persons the hue is sometimes that of discolored parchment. In chlorosis the pallor has a greenish tint. This is seen in girls who have chlorosis, but who are at the same time possessed of an unusual quantity of fat. The pallor in malarial affections, when once recognized, cannot be easily mistaken.

In some diseases the color of the skin is decidedly changed. Such is the case in jaundice, for instance, where the skin is stained yellow with bile, and also in Addison's disease, where there is bronzing of the skin. The color of the skin in these two conditions constitutes an essential part of the diagnosis.

Much may be learned by an accurate observation of the tongue. It will tell us of the condition of the digestive apparatus, the condition of the blood, the condition of the nervous system and of the functions of nutrition and excretion. The expression of disease may be found in its form, its condition of dryness or moisture, its coatings, its color, and its motion.

If we say that its condition may be taken as the type of the condition of parts below we will not be far out of the way. True, there are many exceptions, but the rule is a very good one and will hardly lead to serious error. The mind at once recognizes the changes of form, movement, condition, color and secretion as expressions of local disease. It will not be far wrong if it recognizes them expressions of disease of the entire digestive apparatus,
Change of form is quite expressive and rarely leads us into error. The elongated and pointed tongue expresses the condition of irritation and determination of blood to stomach and intestinal canal very distinctly, and it is safe practice to give it full weight and be very careful in the administration of remedies. As it is associated with excitation of the nerve centers, this is to be taken into consideration when we value the evidence with reference to the stomach and bowels. If we observe this change of form early in the disease, we not only anticipate unpleasant gastric irritation through the sickness and use care in avoiding irritant, but we employ means to remove it. Among these may be named minute doses of aconite, ipecac and bismuth.

The full tongue, broad and thick, is an evidence of atony of the digestive tract, especially of the mucous membranes. In this case the stomach and intestinal canal tolerate the common medicines given, and the use of cathartics is less harmful and may be more beneficial than in others.

The pinched, shrunken tongue expresses a want of functional activity in the digestive apparatus. It is the tongue of advanced acute disease, and is usually associated with dryness. Want of functional activity hardly expresses the condition, for the life of the digestive apparatus has suffered to such an extent that there can be but little function. Whilst it is one of the indications of want of food, it causes us to be very careful in its selection and administration, giving small quantities at a time and at such periods as the unpleasant symptoms are least marked.

The fissured tongue in chronic disease points us to lesion of the kidneys inflammatory in character. In some cases the fissures are transverse only, but in severe cases they are somewhat irregular, and by pressing the tongue down it is seen to separate in irregular patches of prominent villi. The symptom is so definite that one may be assured of inflammation when this tongue presents.

The fissured tongue in the advanced stage of febrile diseases refers us to lesion of the kidneys or irritation of the nerve centers. In many cases we find a wrong in the secretion of urine, and close examination shows a condition of kidneys bordering on inflammation. It deserves careful consideration, and especially means to place the skin in better condition and to allay irritation of the cerebro-spinal centers.

The conditions of dryness and moisture are important evidences of the condition of the intestinal tract. If the tongue is dry, we are sure the stomach and intestinal canal can do but little digestive work, and we give it as much rest as possible. In such cases food is always given in fluid form, and usually above the temperature of 100° F. It is also carefully selected and prepared that the labor of digestion may be as small as possible. If the tongue is dry we are confident there is want of secretion from the intestinal canal and associate glands, and, indeed, that there is a condition present which will prevent the action of direct remedies to favor secretion. It is most absurd to employ cathartics in such cases, unless the object is simply to remove irritant accumulations. Moisture, on the contrary, expresses a condition favorable to functional activity. True, there may be impairment of function, as when the tongue is full, showing atony, or heavily coated, showing increased mucous secretion, or dirty, showing depravation of the blood and secretions.

If in acute disease with dryness of the tongue we observe it becoming moist, we are confident of improvement of the establishment of secretion, and, indeed, of all the vegetative processes. Having this meaning, it is nearly always regarded as a favorable symptom.

The coating of the tongue should be observed with care as they are believed to be symptomatic of many diseases of the digestive tract. An eminent writer, in referring to this subject, in part says:

"The question appears to be capable of being resolved into three principal divisions:

1. What are the nature and causes of the alterations in the tongue which have been regarded as diagnostic of affections of the stomach?

2. In what other diseases, occurring independently of stomach affections, are these changes observed?

3. What is the nature of the alterations of the digestive organs with which these conditions of the tongue have been found to be associated;

The appearances of the tongue which have been most commonly believed to be associated with the diseases of the rest of the intestinal canal are an increase of its epithelial covering, which may present various degrees of thickness and different shades of color; enlargement of its papillae; various shades and degrees of redness of the mucous membrane, and certain alterations in its size and shape.

"The fur or coating has been shown by microscopic examination to consist of epithelium scales, which are often fattily degenerated, and sometimes massed together, of free fat drops, and of confrervoid growths; of these the largest proportion is formed of the epithelial cells which are derived from the covering of the organ together with the saliva and buccal mucus, which in drying form a thick
glutinous material, conglomerating the other elements into a mass.

"The fur may be of greater or less thickness, dry or moist, uniform, or accumulated more particularly at the posterior portions. It is sometimes deeply fissured by sulci, which may extend into the mucous membrane beneath. At other times it may separate in flakes from the surface, which then may look raw, and of a deeper red than natural, but which may, when the process of separation is gradual, present no deviation from the normal appearance.

"Mixed with the fur may be sometimes found pigment, blood corpuscles, mucous or pus corpuscles, or the remains of vegetable and animal portions of food.

"The color may be white or milky, or may present various shades of yellow or brown.

"The nature and cause of some of the changes in color are very imperfectly understood. Some of them arise from articles of food, medicinal substances, tobacco, etc.; a large proportion, however, are caused by slight hemorrhages from the gums; while some others, and especially those occurring in fevers, remain unexplained.

"Excepting, however, those cases where there is direct pigmentary discoloration from jaundice, when other tissues participate in the change, there is no foundation for the common belief that a yellow fur on the tongue has any necessary connection with hepatic disorder.

"As regards the chief causes to which the production of this fur is attributable, may be mentioned:

"Idiopathic conditions in which the tongue of some persons may consistently, with apparently perfect general health, form and throw off a much larger amount of epithelial covering than is ordinarily the case: inquiry should, therefore, he directed to this point before any general conclusions are formed respecting the indications to be drawn from its presence.

"States in which a coating is formed on the tongue by the simple drying of inspissated mucus and saliva, owing to the mouth being kept open, as is often the case during sleep.

"Conditions of irritation in the mouth itself, giving rise to an increased production of epithelium on the cheeks, gums and tongue. and which, from their similarity to the state of other mucous membranes, where increased secretion, attended with shedding of the epithelial covering, is the result of irritation or subacute inflammatory action, are usually termed catarrhal. The belief that this is the true pathology of this state is also favored by the coincidence, in many such cases, either of a general redness of the surface, beneath the thickened epithelium, or of hyperemia and enlargement of the papillae, especially of the papillae fungiformes of the lateral and anterior portions. In some instances, also, the inflammatory state is further evidenced by the production of aphthas, giving rise to slight and superficial ulcerations, with a reddened base, and often surrounded by a reddened margin.

Many of these conditions of the tongue may, however, be due to local causes, such as carious teeth, or other sources of irritation to the fifth nerve, or to accumulation of food around the bases of the teeth, or to medicinal agents affecting the salivary glands and mouth, as iodide of potassium and mercury, or to the habit of smoking (though this does not ordinarily produce a thickened epithelial fur, nor hyperemia of the papillae fungiformes. its effects being generally limited to an enlargement of the papillae filiformes, which gives to the surface a finely roughened aspect). As smoking, however, is not an unfrequent cause of stomach affections, our observations on this head are always attended with certain grounds of fallacy."

Although there is undoubtedly more or less error in the commonly accepted ideas in regard to the coatings on the tongue, much may be learned by carefully observing them.

The vivid whiteness of the tongue, evidently a change in the epithelium, evidences simple functional wrong, and is associated with the febrile state. If observed at other times, it may be taken as all indication that the stomach and digestive tube need rest.

The thin, transparent, mucoid coating of the tongue, evidently upon and from the secretions of the mouth, is an evidence of enfeebled digestive function, frequently from intemperate eating or drinking.

Sometimes the tongue appears much swollen and has a thick, white coating, suggesting the need of calcarea phosphorica. A flabby tongue, with yellow coating at the base, is indicative of a wrong in which calcarea sulphurica is employed with beneficial results.

When there are ulcers in the mouths of little children or nursing mothers, and the tongue is covered with a grayish-white coating, kali muriaticum is called for as the leading remedy.

Cases are often seen in which the edges of the tongue are very red and sore, and at the same time the tongue is covered with a slimy brownish coating. The direct remedy in the condition here represented is kali phosphoricum.

When the tongue has a slimy, yellow coating and its edges are whitish in appearance, kali
sulphuricum will exert a needed influence.

A bright red and sore tongue, which is coated white and has a smarting sensation, calls for magnesia phosphorica.

When there is great dryness of the tongue and there are numerous vesicles on its tip, natrium muriaticum is of great usefulness.

A moist creamy or golden coating on the back of the tongue is often seen. The condition causing this peculiar coating is opposed by natrum phosphoricum.

When the tongue is covered with a dirty, brownish-green or grayish-green coating, and the palate is very sensitive, there need be no doubt of the demand for such remedies as natrium sulphuricum and sodium sulphite.

The fur which has consistence-is evident upon the tongue and can be scraped off-evidences impairment of function and the wrong is generally in proportion to its thickness. If uniformly distributed it may be regarded as having reference to the entire intestinal tract; if restricted principally to the base, we think of greater wrong ill the stomach. The heavily loaded tongue would call our attention to accumulation in the bowels, and would prompt to means (mild) to secure their evacuation. The heavily loaded tongue at the base calls attention to accumulations in the stomach, and suggests the use of an emetic to free this viscus and stimulate normal innervation and circulation.

Yellowness of coating is thought to arise from wrong in the hepatic function, and to point to the use of "liver remedies." Whilst it may have this reference in some cases, it is well to avoid the usual cholagogues. It may be said to call for nux vomica, small doses of podophyllin and Hydrastis. A dull, leaden yellow fur is an indication for Chelidonium. A dull, cheesy looking fur, with slight green tinge, is an indication for copper.

The bright redness of tip and edges, especially of papillae, is an evidence of irritation with determination of blood. It always suggests care in the use of remedies, rest to the stomach, and the special agents named to remove irritation.

A good condition of stomach is of first importance in the treatment of disease, and when these symptoms present these means will hold a prominent place.

The tongue gives us the best evidence of the condition of the blood and of the remedies which rectify its wrongs. All exudations or secretions from the blood must give information of the character of this fluid, and there is no better place to observe them than in the mouth. The circulation of the blood is also very free and superficial in the tongue, awl we arc thus enabled to observe its changes of color better than in other situations, The reader will recollect the distinction between the tongue itself and the fur or coating. When color is spoken of as the one is from the circulating blood and the other from 'the exudation.

The broad, pallid tongue marked want of color in the tongue itself-evidences the want of the alkaline elements of the body. The evidence is clear and distinct, and the want one of much importance. It may be the basis of the entirety of the disease, which will fade away as soon as the proper alkali is given or it may be but a portion of the wrong and the alkaline salt prepares the way and facilitates the action of other remedies.

If there is no special indication for some other, we prescribe sodium because it is the salt of the blood. Usual1y the bicarbonate of sodium in small doses will he indicated. If there is predominant wrong of the muscular system, we may select a salt of potassium. Kali phos. will often be indicated. If of the cellular tissue, a salt of lime.

The deep-red tongue (usually contracted and dry) evidences the want of an acid. as well as that condition of the blood known as "typhoid." Here, as in the preceding case, the want of an acid (undue alkalinity of blood), may be the principal element of disease, and all the symptoms are ameliorated and the patient convalesces when it is given. In other cases it is but a portion of the disease, and the acid facilitates the action of other remedies. It is a very common symptom in typhoid and typhus fevers, and the use of an acid in these cases has been found a very successful treatment by many eminent physicians.

In this case we select with reference to the stomach and the blood poisoning, Muriatic acid usually receives the preference, as it is well borne by the stomach and is a powerful antiseptic. It should be given in small and frequently repeated doses. In 'some other cases lactic acid, in the form of whey. answers an excellent purpose, as it furnishes a calorific food as well.

The deep red or deep violet colored mucous membranes, with fullness, evidences, sepsis, and is an indication for the special remedy, baptisia. The acid should also be given in some cases,

The full color, with violet shade, superficial and transparent, is the indication for nitric acid, and it will be found one of the most valuable remedies of the materia medica.

The tongue large, thick in center, with incurved edges and of a dull blue or leaden color, is one
of the strongest indications for arsenic; it will rarely fail to arrest the progress of disease in such cases.

The same dull, leaden color, with no change in size or shape of the tongue, is one of the best
indications for the use of phosphorus or the hypophosphites.

The stick, raw-beef tongue, the papillae wholly effaced evidences sepsis of the blood and is
one of the most marked of the "typhoid" symptoms. The color of the tongue is usually deep, and we
will employ all acid and baptisia. The exudation or fur upon the tongue is a pretty good index of the
condition of the blood. Of course, we must weigh the influence of local disease of the mouth and teeth,
and the sympathetic relations with the stomach and bowels, as heretofore named.

The dirty fur is an indication of sepsis of the blood as well as of deprivation of the secretions. It
is frequently associated with moisture and the redness is rarely increased. We use the common word
"dirty," because it expresses our meaning clearly - the impression upon the senses is that of dirt, and its
meaning is dirt. It may be a dirty-white, a dirty-gray, a dirty-yellow, or a dirty-brown, but the dirty,
grimy appearance always assumes prominence in the mind.

If we have a dirty tongue, pallid, we usually think of sulphite of sodium. If the redness is
natural, we may use sulphurous acid or sulphite of magnesia. If dirty, with increased redness, muriatic
acid. If the coating is of a dirty, brownish-green or grayish-green color, natrium phos. will prove the
needed remedy.

All shades of brown and black have reference to the condition known as typhoid. We have
every shade of color from the slight tinge of brown to the deep brown or almost black. It is not only the
coating of the tongue that shows this color, but accumulations of sordes about the teeth, and sometimes
crusts upon the lips. As is the deepness of color, so is the wrong known as "sepsis," and so is the need
of the class of remedies known as "antiseptic." As is the deepness of color, so is the impairment of life,
and the need of care and rest to conserve it, and of food and restoratives to support it.

These dark coatings are so usually associated with deep redness, that we usually think of acid
remedies, first of which is muriatic acid. But some of the cases will need baptisia, and in others
echinacea will be indicated. Cleanliness is of especial importance in these cases, as all decomposing
animal matter in the air or surroundings increases the wrong of the blood.

The reader may not have thought that the tongue could tell him much with regard to the
condition of the nervous system, and yet a little study will show that it does give very important
evidence. It has special reference to the condition of the sympathetic nervous system, and this may be
regarded as the most important, but we also learn much of cerebra-spinal innervation.

We associate dryness of the tongue with excitation of the nerve centers, especially the
ganglionic. So positive is the evidence that it is not possible to mistake it. Dryness of tongue is
associated with vascular excitement and with arrest of secretion from this cause. If in acute disease,
with dryness of tongue, we find it becoming moist, we know that the nerve centers are being relieved,
and that the circulation is improved and secretion is commencing.

If in a case of disease marked by enfeebled innervation from the sympathetic and moist,
relaxed tongue, the tongue commences to dry and becomes firmer, we know that the nervous system
has been stimulated, and many times it is a first evidence of amendment.

Whilst dryness always evidences undue excitement of the nerve centers and calls for sedatives,
or that class of agents which remove this, too much moisture and relaxation is evidence of the opposite
condition. Dryness of the tongue is a reliable indication for natrium mariaticum. Moisture of tongue is
one of the prominent conditions assuring us of the kindly action of quinine, and even of opium when
indicated. If marked, and accompanied by full, relaxed tissues, the patient always requires nerve
stimulants. Contraction is always an evidence of an excited nervous system. Sometimes, indeed, we
may measure the wrong of innervation by this symptom, as in typhoid and typhus fevers and in the
later stages of acute disease. The reader who has seen the great nervous wrongs of these affections,
will recollect the pinched, contracted tongue as one of the prominent symptoms.

Fullness of tongue has the opposite meaning. If marked, we arc quite sure that innervation is
impaired from atony or want of normal stimulation of the nerve centers, especially of the sympathetic.
It suggests nerve stimulants as a part of the treatment. podophyllin and crataegus for the solar and
cardiac plexus, and nux vomica, strychnia, belladonna or ergot for the associate sympathetic and spinal
nervous systems, with quinine for the associate wrong of the three, or simply for the brain alone.

Whilst the elongated and pointed tongue has especial reference to the stomach and intestinal
channel, it is one of the expressions of disease of the base of the brain. It is well to note this fact, for we
may have the wrong of the brain as the primary lesion, the nausea and vomiting being but the result,
and if treatment was directed wholly to the stomach we would make a great mistake. Gelsemium
assumes a prominent place here associated either with Veratrum, aconite or ferrum phosphuricum.
The small tongue, full in the center, which is covered with a thick, tenacious; mucoid coat, is an indication of marked disturbance of the brain, until we have evidence of acute disease of the ear; the globes of the eyes, or the sphenoidal or ethmoidal cells. It may indicate a very grave lesion, or in the latter case will pass away with the local disease. In those cases where the coating is removed, the surface is left slick and very dark colored.

The tongue covered with a grayish or yellowish fur, showing small patches of red distributed uniformly over the surface, is the tongue of scarlet fever. The same appearance will be seen in other cases; where the capillary circulation of the skin is enfeebled. In these cases kali muriaticum and belladonna will markedly benefit the patient.

The eroded appearance of the papillae at the tip of the tongue, looking like small rose-colored bubbles, evidences a peculiar wrong of the nerve centres and of the blood for which rhus toxicodendron is the remedy.

The movements of the tongue are sometimes of importance in determining the condition of the brain. If the patient has complete command over it, we conclude that the functions of the brain are still well performed, not if it is protruded with difficulty, is tremulous, or is inclined constantly to one side, we are confident we have a proportionate cerebral lesion. Whilst we might get the evidence elsewhere, it is quite as well to give weight to these symptoms, and, when observed to adopt means early for the relief of the brain.

From what has been said the reader will draw the conclusion that impairment of nutrition and secretion will be indicated by marked dryness and contraction on the one hand or increased moisture and relaxation of the other. In the first case there is undue excitement, and if we select remedies to increase secretion or excretion they will be of a sedative character. In the other case there is a want of innervation, and the remedies will be those which will give stimulus and tone.

There is a sodden unpleasant looking- tongue which is quite as good evidence of cacoplastic material in the blood as any we can find. We recognize at once the evidence of enfeeblement of the digestive functions and if there is local irritation we expect that the exudate will be of this character, readily breaking down and destroying the tissues, In some cases of hectic fever during long supplicative processes, the tongue becomes indurated, suggesting the need of small doses of silicea.

In an article on the importance of carefully studying the condition of the tongue in our examinations of the sick, Prof. J. M. Fothergill, in substance, says:

When seen in the early stage of typhoid fever, a tremulousness of the tongue indicates a grave condition. In advanced stages the tongue is protruded slowly and with difficulty indicating impaired power over the muscles. In hemiplegia the tongue, when protruded, turns its apex to the paralyzed side, as a result of decreased power in the genio-hyglossus muscle of the affected side. In glosso-labial paralysis, the capacity to protrude the tongue is impaired or lost. In facial paralysis without hemiplegia, this loss of power to protrude the tongue tells that the wrong is central and within the skin, and not peripheral, or Bell's palsy.

Dryness of the tongue is found in pyrexia. The tongue is also dry in diabetes and other conditions of polyuria. and in some of the functional wrongs of digestion it becomes dry and hard, as well as brown, from the accumulation of dead epithelium cells upon it in the typhoid condition and in uremia. The tongue becomes indented and marked by the teeth in some conditions of debility from menorrhagia, chronic diarrhea and in acute prostration. A coated tongue is constant with some individuals who are apparently well and strong, and a furred tongue, especially in the morning, is common with excessive smokers. Usually a coated tongue denotes a disturbance of the digestive organs or the beginning of acute fevers. When the coating has a distinctly yellow or brownish color, there is usually a bad taste in the mouth on awakening in the morning. The taste and the color are due to taurocholic acid. The coating on the tongue in this case consists mainly of dead epithelial cells, mucus, particles of food, and dust inhaled by the breath. As a rude index of the condition of the gastrointestinal canal, the state of the tongue furnishes valuable information. Where the coat is thick it is evident that absorption of food in the intestines must be very imperfect, through the layer of dead epithelial cells, and our efforts should be directed to the removal of this obstructive layer.

Consequently, we inspect the tongue in acute diseases, and in convalescence, in order to ascertain as nearly as possible whether the state of the intestinal canal is such as will permit of the assimilation of the food and medicines taken. When the tongue clears we know assimilation is going on satisfactorily. When the tongue remains coated we endeavor to aid in the natural efforts to remove the coating by such means as may be indicated by the symptoms. In protracted illness the coating on the tongue may he shed and reproduced several times. After acute diseases, and especially after fevers, the coating may disappear little by little, commencing at the tip and creeping along the edges, leaving a thick coat up the mesial line and upon the base, which gradually disappears as secretion is re-established. In scarlet
fever the tongue often assumes a strawberry appearance. Sometimes the red papillae stand out upon a red surface like a ripe red strawberry, and at other times the red papillae stand out upon a coat of fur, like the seeds of an unripe white strawberry. A coated tongue is common in many cases of dyspepsia especially when many by-products of digestion are formed in the digestive act. Both in indigestion and in artificial digestion there are by-products formed, as well as peptones, and these by products are often very offensive. In some cases of acid "heartburn" the chief offending agent is butyric acid.

The tongue may be coated along one side only or it may be raw and irritated. The raw, or bare, tongue has not received from medical writers the attention which should be given to it.

In this condition the superficial structures of the tongue are denuded, more or less completely, of the natural epithelium. In convalescence from acute disease, where the tongue has been coated, sometimes it is abnormally red and imperfectly covered with epithelium. Here a coat is very likely to form again. The absence of the normal epithelial covering of the tongue, whether slight or extensive, should receive the most careful attention of the physician. As long as the tongue is raw or bare the line of treatment should be that of bland food with mild sedatives to the gastro-intestinal tract. So long as this condition remains, tonics and stimulants are useless, and may even do harm. It is in phthisis, perhaps, of all diseases, where there is this rawness of the tongue, that the greatest apprehension should be excited. The rawness is not usually complete over the whole tongue, but it often forms a large patch in the middle of the tongue, the irregular edges usually extending farther on one side of the mesial line than on the other.

There is every reason for supposing that this condition of the tongue is an indication of the state of the unseen portion of the gastro-intestinal canal, and that the absence of the epithelium interferes with a assimilation. It is for this reason that this condition excites apprehension in all wasting diseases. Not only is the epithelial layer important in the absorption of nutritive material from the food in the intestines, but it is essential to secretion. This fact is well pointed out by Prof. M. Foster when he says, in substance:

The food, in passing along the alimentary canal, is subjected to the action of certain juices which are the products of the secretory activity of the epithelium cells; of the alimentary mucous membrane itself, or of the glands which belong to it. These juices (namely, saliva, gastric juice, bile, pancreatic juice, succus entericus and the secretion of the large intestine) poured upon and mingling with the food, produce in it such changes that, from being largely insoluble it becomes largely soluble in an alkaline fluid, such as blood, or otherwise modify it in such a way that the larger portion of what is eaten passes into the blood, either directly by means of the capillaries of the alimentary canal, or indirectly by means of the lacteal system, while the smaller part is discharged as excrement.

Now, if Prof. Foster is correct in his conclusions, and it is generally conceded that he is, it is abundantly clear that any deficiency in number or perfection of these epithelium cells; must exercise a deep and profound influence upon digestion, absorption and nutrition. The physician’s greatest energies should, therefore, be directed toward the restoration of the epithelial layer to normal perfection, or the nearest approach thereto. If, under judicious treatment the tongue assumes its normal appearance, and the epithelium once more gross freely upon it, then we know that the powers are returning, and that tonics and more food of a restricted character may be safely employed. As long, however, as the raw condition of the tongue continues, so long must we direct our therapeutic measures to the restoration of the epithelial layer of the alimentary canal to its normal condition. The tongue may present a beefsteak appearance when it is denuded of epithelium, as it is likely to do when the brown fur of the typhoid or uremic condition has been shed.

The epithelial layer of the tongue is often suggestive of other conditions than those of the alimentary canal. There is a peculiar silvery sheen of the epithelial covering of the tongue in many cases of menorrhagia, especially when the tongue looks swollen and shows the indentation of the teeth. In relapsing fever there is often a small triangle on the tip of the tongue, much cleaner or more raw than the rest of it.

The surface of the tongue may be altered, and the mucous membrane may be ulcerated, as in stomatitis, or it may be fissured. It may also be the seat of a chancre, which must be differentiated from cancer.

CHAPTER VIII.
DIAGNOSIS BY THE SENSES OF HEARING AND TOUCH.

In diagnosis, the sense of hearing, when trained into associate habits with the senses of sight and touch, constitutes an indispensable factor. This sense, like the other human senses, is capable of
becoming wonderfully developed. As an evidence of this fact, it is said of an eminent physician that his sense of hearing had become so acute that he often made the correct diagnosis before seeing the patient, the ear identifying the disease from the gait of the patient as he approached the doctor’s consulting-room.

The wrongs of life find expression through the usual channels of expression; where the nerve currents have been most in the habit of flowing in health they incline to flow in disease. Mankind use the facial muscles to express their feelings or sensations and hence disease is expressed in the face. For the same reason we should expect to find wrongs of life expressed in the voice in all animals using the voice, and especially in man, who finds it a principal instrument of expression.

As we enter the sick-room we give attention to the voice of the sick person quite as much as we do to what he is saying. We find that it expresses strength or weakness, is free or difficult from local disease and shadows forth the condition of the brain in its tone, which varies from the listlessness of atony to the querulousness of excited feebleness and the excitation of over-activity.

In studying the voice as the expression of disease, we recognize its threefold hearing as it refers us to a general impairment of life, a lesion of the brain, and to lesions of the respiratory apparatus. If we did not keep these sources of wrong in view we might make serious mistakes. If, for instance, we have feebleness of voice, it may be due to general impairment of life, to impairment of the functions of the brain, to deficient innervation from the spinal cord or to a lesion of the respiratory apparatus.

Whilst strength of voice is usually regarded as evidence of good vital power and a good respiratory apparatus, it will not do to place too much dependence upon it in these regards. It certainly evidences good innervation from the brain and spinal cord. But if these nerve centres are sound, active, and well supplied with blood, we may have a strong voice, even though the body at large is nearly exhausted. Usually it is a favorable symptom.

Feebleness, on the contrary, evidences a lesion of atony, either of the body at large, of the brain or mind, of the spinal cord, or of the respiratory apparatus. Whilst the probabilities are in favor of its being a nervous lesion, we will not take it for granted, but make such examinations as will localize the lesion. Feebleness simply, without querulousness, suggests the use of phosphorous, the hypophosphites, cod-liver oil, iron, arsenic or quinine. If it is associated with a marked effort of the will, and a sighing respiration, we refer it to deficient innervation from the spinal cord, and think of strychnia, ergot or santonin as remedies. In lesion of the respiratory apparatus there will be change in the voice other than feebleness.

It is difficult to give a name to the peculiar expression of voice associated with nervous irritation and vascular excitement, yet the reader will learn to recognize it readily, and may frequently be able to determine these characters by simply hearing the patient speak. There is a sharpness and want of smoothness, representing pretty accurately in degree the amount of disease. The halting voice, evidencing a labored action of the brain, tells the story of congestion, and suggests the use of belladonna. The oppressed voice, hollow and unsteady, evidences a general impairment of life, and calls for stimulants, tonics and food. The oppressed voice from the upper part of the lungs suggests deficient innervation to heart and respiratory apparatus, and causes us to think of crataegus, and in some cases of stimulant doses of lobelia.

Sharpness of voice suggests nervous excitation, and will sometimes point to the remedy, as in the peculiar sharp accentuation of the rhus voice, resembling the cri encephalique of the child.

The cry of the child will frequently inform the physician of the location and character of the disease. Of course, we recognize the fact that there may be but little change in the cry, or that there may be changes without corresponding disease, but we have ether means of diagnosis to supplement this and prevent error. Physicians who have given this subject attention will recall the peculiar cry of abdominal distress, the change which marks disease of the respiratory apparatus, the oppressed cry of congestion, the shrill metallic cry of inflammation of the brain, etc. It does not take much observation to distinguish the cry of disease from the cry of hunger or anger.

In the preceding paragraph a peculiar cri encephalique, was noticed, which is so distinctive that it will never be mistaken. Its suddenness and shrillness is characteristic. In its slighter forms it arises from cerebral irritation and determination of blood, and calls for gelsemium as the remedy. When marked and shrill, rhus tox. should be added to the prescription.

A sudden cry followed by sobbing respiration is a prominent indication for bromide of ammonium.

The voice is the function of the larynx, and its changes will point us to diseases of this organ. The croupous cry and voice is quite as distinctive as the croupous cough. If it evidences moisture, we
have mucous croup; if it is dry and metallic, pseudomembranous croup; if variable in tone and character, spasmodic croup.

In chronic disease of the larynx roughness of the voice is one of the first symptoms. As the disease progresses, we have various changes in the voice, and difficult use of it, as characteristic symptoms.

In chronic bronchitis we also find change, but not similar in kind. It may give the voice shrillness, as in irritative bronchitis, or dullness, hollowness or reverberation, as in asthenic bronchitis.

The sense of hearing is of the utmost diagnostic value in coughs. Without a well cultivated sense of hearing many coughs would be incomprehensible.

A cough is usually an expression of disease of the respiratory apparatus; and of all the features, physical and mental, which make up the sum total of a consumptive. cough is the most distressing and prominent symptom. Cough may, however, have its origin in diseases other than those of the respiratory organs. For instance, we find cough from gastric, biliary and intestinal lesions, and from diseases of the nerve centers, and our examination is made with reference to these probable causes in obscure cases.

Cough is the expression of irritation, and comes from the use of an irritant material in the respiratory passages, which it intended to remove. But many times there is nothing to be removed—it is a misconception of the respiratory nerves which suffer from irritation, and we wish to determine whether or not effort is to be favored. In the larger number of cases expectoration is undesirable, and if we remove the irritation of the nerves the cough ceases. A little attention upon the part of the physician will determine this point, as it is quite easy to distinguish the cough necessitated by decreased secretion and attended by expectoration, from the inefficient, rasping cough of irritation. In either case, but especially in the last, an effort of the will is of marked benefit in checking cough.

The character of the cough expresses to some extent the condition of the respiratory passages. If dry, ringing, metallic, we think of irritation, determination of blood, and arrest of secretion, and the remedies at once suggested are those which allay irritation, check determination of blood, and favor normal secretion. If moist, rattling, gurgling, dull stimulants to the respiratory passages, as well as remedies to relieve irritation are suggested.

A cough is more or less forcible, and more or less under the control of the patient. If forcible, not under control or explosive, we at once suspect a wrong of the nerve centres, usually of the basilar brain, and "elect remedies accordingly. Of course, we may have such uncontrollable cough from local irritation, especially of the throat, but this will be readily recognized by the expression, as well as from the patient's sensations.

A cough has more or less evidence of strength, both of the respiratory apparatus and of the body at large. The strong, well-sustained cough may be a source of annoyance, but evidences good vitality and a naturally good condition of the respiratory organs. A feeble cough, on the contrary, is the evidence of debility, and at once suggests the necessity of care in the conservation of life, and the employment of means which will give strength, especially the selection of proper foods. A cough may be feeble from deficient spinal innervation, and spinal stimulants would prove the best remedies.

Coughs are spoken of as short, hacking, deep, bronchial, etc., and these characteristics may suggest the locality of disease. A short cough may arise from disease of the upper lobes of the lungs, or it may be due to disease of the parenchyma of the lung, as in the first stage of a pneumonia. The hacking cough evidences irritation of the respiratory nerves pointing in the throat. The deep or bronchial cough is at once referred to lesions of the bronchial tubes, though it is not as good evidence as we would wish.

A cough may have its origin in irritation of any part of the respiratory apparatus, from the pharynx, larynx, trachea, bronchial tubes, parenchyma of the lungs, to the pleura. As named above, its character may suggest the seat of disease, but, as a rule, it is not definite. A singular thing about coughs is that the irritation points so that the patient can localize the sensation of irritation for us. Cough very frequently points in the pharynx, and the irritation of the throat seems to be its direct cause; such a cough is based to a considerable extent upon the irritation of the respiratory nerves, and remedies directed to relieve this will be the best cough medicines. In other cases cough points about the suprasternal notch, and, if very severe and persistent, suggests the use of remedies which influence the sympathetic nervous system, as veratrum, bryonia, cactus or pulsatilla.

Coughs may be spasmodic and paroxysmal, even in severe cases showing distinct epileptiform symptoms. Whooping-cough is the typical spasmodic cough, but we have in the cough of measles and
some diseases of the respiratory apparatus, the same characteristics. It suggests drosera, belladonna, bromide of ammonium and magnesia phosphorica.

Through our sense of hearing we are able to obtain much information from the patient and nurse. While this information is often of value, we should ever bear in mind the fact that in its source the elements of uncertainty are very great, and that it will be well, therefore, for us to pursue our inquiries with much care. Questions should never be suggestive, but should be so put as to let the nurse or patient tell what they know, or to require but the simple and direct answer. yes or no. Careful attention to these points, and a continued guard upon the tongue, will soon form a habit of examination that will lessen the danger of erroneous in formation.

We prefer to get information from attendants with regard to the general condition of the sick, and the performance of the essential functions of life.

From the patient we desire to know his sensations, as these are changed by disease. A first examination may take the following course: How long sick? What are the seeming causes of the sickness? How did it commence? What has been noticed with reference to the progress of disease up to the present time? How does the patient rest in the daytime? at night? What food and drink does he take? How often docs he have a motion of the bowels? does he pass urine? These questions may seem suggestive and once in a while they may take a simpler form, as: Does he sleep? Does he eat? Does he drink?

It is most absurd for the attendant to attempt a description of the sensations of the sick, and yet they almost always volunteer to do it. Many times they will be continuously making suggestions to the patient, and lead him into erroneous statements. They will probably have formed some theory of the disease, and will bend everything to the support of their theory. Physicians are very frequently guilty of this, and should try to rid themselves of the bad habit which they condemn in nurses.

The question, How do you feel? e1icits a loose. wandering description of the patient's sensations. and is only important in that it suggests special questions and examination. The question, where do you feel bad? is pertinent, and will elicit valuable information of local disease. It does not do to take it for granted that the patient's anatomical or physiological knowledge is perfect, and that his reference to heart, lungs, stomach, liver, etc., means heart, lungs, stomach, liver.

The direction at once follows-put your hand on the place. It is a little singular to find after a patient has located a disease in his own mind, the hand meanders about with uncertainty trying to find its location. If the unpleasantness is marked and means local disease, the patient has no difficulty in placing his hand upon the exact spot. If there is anything uncertain in the patient's manner or method, and especially if uneducated, we wish him to describe his sensations with the hand upon the affected part. In many cases we will find that the description commences to wander as soon as the hand is removed. There is a reason for this. With the hand upon the part the mind is directed to it and concentrated, extraneous ideas are rejected and the description is of actual sensations.

We want to know the character of the pain, its duration, exacerbations and remissions, periods of recurrence, and its influence on function. In this examination the physician should show by his questions and manner that he wants concise and specific answers.

The subject of pain is a study of itself, and much less is known of it than we would wish. In some cases it indicates the special remedy which will cure; in others, it simply points to a pathological condition, and remedies must be selected by other symptoms.

Thus if we have a pain in the head. heavy, tense, and the patient sleepy, we give belladonna; if it is sharp and restless, gelsemium; if sharp. limited in location. despondent, pulsatilla. If of the frontal region and orbits, with burning, rhus; if of the right side, passing from before backward, bryonia; if of the back of the head, dull and heavy, iron.

The pain in right hypochondrium, pointing to the umulicus-indeed, all pains pointing at the umbilicus-nux vomica. Pains deep in the ischiatic notches, podophyllin. Pains that are tense and paroxysmal. macrotys. The pain of macrotys is a singular one. It feels as if dependent upon tension and is decidedly remittent-a continued succession of tense pains. We usually prescribe macrotys for muscular pain, no matter what its character, and hit it in a large majority of cases. For this remittent tense pain-waves of pain-no matter where it is we may prescribe the macrotys with certainty (the pain is not throbbing).

If we take the pain of lobelia we will find its principal characteristic anguish. of which angina pectoris and neuralgia of the heart offer the most common examples. It is that indescribable sensation as if the life was being forcibly driven from the part-anguish expresses it. Lobelia is specific to it. Give twenty to forty drops of a good tincture of the seed to a person suffering from angina. and there is instant relief, which becomes complete in a short time. In referring to the pain characterized by anguish, Prof. J. M. Scudder said:
"I have seen one case of uterine neuralgia presenting this character, and from which the patient had suffered beyond conception—a single dose of lobelia arrested the paroxym; and its repetition when the symptoms were felt gave a radical cure. I have seen two cases of abdominal pain presenting this character to some extent, and both were relieved by lobelia. A singular case of hypochondria, in which the feeling as if a movement of the body would endanger life, but without pain, was cured with lobelia.

The peculiarity of this pain or sensation is so distinct that may describe it. For many years (indeed, it was one of first things I learned in practice) I have given lobelia in certain cases of labor where the pains assumed this character. Every one will have recognized the two classes of pain, one of which is well borne, which is really relieved by the action of the and the other which finds no such antagonism.

In the latter class I find the indication for lobelia, and it has proven one of the most efficient agents I have ever used in obstetric practice."

Nux vomica is indicated in any pain having a tendency to point at the umbilicus; it is accurately located. It may be a simple colic, a bilious colic, a derangement of the function of the liver, a wrong of the spleen, a dysmenorrhea, a disease of the colon, irritation of the bladder—if the pain shows the constant tendency to the umbilicus, give nux.

The pain indicating rhus toxicodendron is very distinctive. Frontal pain, especially involving: the orhitis, and inclined to be more severe on the left side. Such pain should lead us to prescribe rhus. if there are no other indications. To any pain add burning, and we would think of rhus as a possible remedy.

Given the pains of rheumatism with burning, and rhus is the anti-rheumatic, or is alternated with macrotys. The pain calling for bryonia, whilst it may be sharp or dull, always has with it a sense of oppression, as if the part were enfeebled and could not perform its function. Take a case of pleurisy, or pleuro-pneumonia, or pneumonia, with this sense of oppression and feebleness, as if the part could not and should not do its work, and bryonia. with the proper sedatives will prove curative.

In the same way a rheumatism, giving the same symptoms of inability, with increased pain following the use of the part involved, will be cured by bryonia. The pain calling for belladonna is dull, heavy, full, with a sense of functional impairment. It makes but little difference where you find it, or in what disease: whether a simple headache, an ague, "bilious fever", or inflammation of the lungs, belladonna will prove curative.

The pain calling for stramonium is constrictive, and when involving muscular structures is attended with persistent contraction, but when of the outlets of the body, it is expulsive. A case of dysentery with most violent expulsive movement of the pelvic muscles, was speedily relieved with stramonium; as was a case of broncho-pneumonia, showing as a symptom a most marked and unnatural constriction of the chest.

The pain calling for gelsemium has as a marked feature exalted sensibility and arterial throbbing. In some cases, especially in the head, the patient dreads movement, and the pulsation of the arteries is distinct and painful. With such pain in any part of the body, we would prescribe Gelsemium with every assurance of success.

The pain calling for chelidonium is dull, heavy, tensive, with occasional twinges, as if the part were being torn. Situated in the right hypochondrium or epigastrium, chelidonium is the "liver medicine." The pain for iodide of ammonium seems to involve a definite amount of tissue, as in inflammation, and yet points at some particular place which might be covered with the tip of the finger.

Uterine pains associated with backache are greatly modified by the use of calcarea phosphorica. The same remedy is of relieving value in the pains which often occur just before the menstrual period. Bearing-down pains in the hypogastrum, from which many females severely suffer, are promptly lessened by helonias and calcarea flourica.

In thus calling attention to the symptomatology of certain pains in therapeutics, it should not be understood that it is claimed to be infallible. Our own senses are imperfect, even when trained by long observation. The senses of the patient are untrained and impaired by disease. and his descriptive powers may be very feeble.

The educated sense of touch is a most valuable aid in the diagnosis of many wrongs of life. In the diseases of women it is of the utmost importance. The finger tells the condition of the uterus, not only as regards position, but pathological changes as well. It determines diseases of vagina, bladder, rectum—indeed. of all these parts—and does it so well that it becomes our must reliable guide to treatment. In all forms of uterine disease the abdominal touch affords much valuable information.

The obstetrician relies wholly upon the sense of touch, not only in determining the presentation and position of the child, but the condition of every part engaged in the process.
His touch tells him the condition of the depending portion of the uterus as an outlet, and also the condition of the organ as regards the power of expulsion. It determines the condition of the vagina as a parturient canal, and becomes so sensitive that it recognizes intuitively changes of condition that will render the labor painful, protracted or difficult.

In a case of labor if the examination shows constriction with want of secretion-pinched expresses the condition of the parts, both of the lower segment of the uterus, vagina, and perineal tissues—we know we will have a protracted and difficult labor.

If the hand is placed upon the abdomen over the uterine globe, and we get the same sensation of unnatural contraction-pinched—there is rigidity of the os perineum, and the remedy suggested by this condition is gelsemium.

If, upon examining muscular tissue, the same unpleasant sensation of contraction and with pain, is imparted to the touch, aconite and cimicifuga be the remedial agents needed. If in chronic disease of the pelvic viscera we obtain the same sensation, as the hand rests upon the lower abdomen, gelsemium, aconite and cimicifuga will act in a curative direction.

If on examination during a tedious labor we find the tissues thick and doughy, with the os and adjacent parts rigid, lobelia will promptly modify the patient's sufferings. The touch here tells the story clearly and also names the remedy which we find on trial acts.

The sense of touch constitutes an important means of diagnosis in the lesions of nutrition and excretion-supply and waste. If there is loss of size and weight, we want to know whether this change results from loss of fat or muscle, and for the one we use our sense of touch on the covering of the false ribs, and for the other on the muscles of the arm. It would not do to feed a patient with preparations of beef or other material if we thought we might give calorific food to save tissue.

The sense of touch will in many cases tell us of the medicines that will prove curative. If the sensation be of want of tone—tissues loose and flaccid—we think of bitter tonics, quinine, the hypophosphites and iron. If the sensation be of structures pinched and stringy, we look for lesions of the nerve centers and think of cimicifuga, hydrochloric, lactic and phosphoric acids, fatty inunction, etc.

The sensation of fullness without elasticity would suggest old tissues and the necessities of active waste. In this case acetate of potassium, iodide of potassium, and stimulant cathartics and diaphoretics would constitute leading remedies. If digestion remained good, these might be sufficient, for the tissues would be renewed as fast as broken down. But if their use gave soft and flaccid tissue, we should supplement this by such a restorative as the triple phosphate of quinine, strychnine and iron, and remedies of a similar character.

We would never give iodide of potassium in secondary syphilis, where the tissues give the pinched and stringy sensation to the touch. Such a case would ask for veratrum, cod-liver oil, iodide of ammonium, echinacea and arsenic.

The value of the sense of touch as an aid in diagnosis and prognosis in diseases of the nervous system is spoken by Prof. William B. Pritchard as follows:

"The sense of touch is one of the most valuable and at the same time neglected aids in refined diagnosis. The presence or absence of atrophy, for example, often decides the diagnosis, and, of course, the prognosis and treatment. The eye cannot always be relied upon. In infantile spinal paralysis the loss of power is often widespread at first. It is important to know what degree of residual, permanent paralysis will be present. This is indicated by the atrophy. The contour of the limb in which atrophy exists may not be altered, and this is especially true in fat, chubby children. The sense of touch, if educated by training, will settle the problem much more certainly than the eye. Hemiatrophy of the tongue is often apparent to the sense of touch when the eye discloses nothing. The difference between contracture and contraction, sometimes quite important, is determined by touch. The twitch of chorea, when latent, in cases just developing or on the road to recovery, is at times determinable only through the sense of touch."

Prof. Robert T. Morris, one of the most eminent surgeons of the present day, has the following to say of the sense of touch in the diagnosis and prognosis of appendicitis:

"In any form of appendicitis, palpation is the first and by all means the most important procedure upon which to depend for obtaining testimony. The history of subjective symptoms in any given case may lead one toward other diagnoses, but palpation will give the keystone among facts elicited in getting the history of a case. The degree of technical skill necessary for accurate palpation of the appendicular region is acquired so readily that students who at first cannot depend at all upon their sense of touch, and who cannot palpate a kidney or the free border of the liver, are soon enabled to palpate a normal appendix by giving strict attention to careful attempts at palpation. In acutely
progressing cases of infective appendicitis it is often unwise to attempt to palpate the appendix itself, but palpitation of the abdominal wall gives sufficient testimony. It is in interval cases, or in cases of appendicular inflammation without infection, that we can examine the appendix most readily with the finger-tips.

It is essential to have the appendix against some fixed point, in order to examine it accurately by touch through the abdominal muscles whenever possible; even then it is not sufficiently fixed for good palpation unless we steady the cecum by pressing the abdominal contents towards the right iliac region by making firm pressure with one hand upon the left side of the patients abdomen. It is important also to avoid exciting a reflex contraction of the muscles of the abdominal wall by ‘poking’ the abdominal wall with the finger-tips. It is best to use three fingers of the right hand, placed rather flatly upon the patient’s abdomen, when beginning palpitation; or, if that excites contraction of the abdominal muscles, the whole hand or both hands are used for making general pressure at various points on the abdomen for a moment. Palpation with the whole flat hand gives the best appreciation of the degree of the contraction of the abdominal muscles, no matter whether infection of the appendix is present or not. In their first attempts at palpation of the appendix, students are apt to find only the cases in which plastic exudates have made a mass in the appendical region. Gradually they get to recognize the cases in which there is thickening of the appendix wall alone, and finally they are able to palpate normal appendices, or in many interval cases to state that the appendix is scarred, or contains a concretion, or is variously angulated by adhesions. Many practitioners believe that the normal appendix cannot be palpated, and one needs only to observe their attempts at palpation to realize that they are honest in their conviction. It certainly requires a little special training in order to do the work well.

“The simplest and commonest form of appendicitis is not the result of an infective process, but results from a normal involution of the inner coats, which takes place in almost every individual after middle life, but sometimes beginning as early as the twentieth year. In this normal involution of the appendix, the lymphoid and mucous layers are gradually replaced by connective tissue. Involution commonly begins at the distal extremity of the appendix and causes gradual occlusion of its lumen. The connective tissue which replaces the lymphoid and mucous coats contracts and irritates the terminal filaments of the sensory nerves of the appendix, so that the patient has a feeling of dull pain directly in the appendical region. This pain may disappear for several days at a time, and yet the patient is conscious of a certain amount of discomfort in this region most of the time. The contracting connective tissue in the appendix irritates also the sympathetic nerve filaments which are engaged in the scar tissue, and we apparently have a reflex irritation of Auerbach’s plexus and Meissner’s plexus over a large area of bowel surface, so that intestinal fermentation becomes a prominent feature of the case, and is frequently the only one which receives attention at the hands of the consultant. Palpation in cases of normal involution of the appendix gives us an abdominal wall which is rather more resistant than normal, but not so resistant as in cases with infection. Palpation of the appendix itself gives us a feeling of hardness of the tissues of the appendix in the involved area.

“The symptoms of normal involution of the appendix, aside from those of discomfort in the appendical region, are chiefly those of intestinal fermentation. The prognosis in these cases is good, so far as the question of danger to life is concerned, but the cases in which the symptoms drag on for years often incapacitate a patient from doing the full amount of physical work for which he is naturally adapted.

“In tuberculosis of the appendix, the symptoms are very much like those of involution of the appendix, with two distinct exceptions: when pressure is made over the appendicular region the patient complains of very much more local tenderness than he does in cases of involution. In tuberculosis the infection is progressive, and soon extends to neighboring structures, while in involution of the appendix the symptoms may be as well marked in the first year of the disturbance as they are five years later.

“Cases of true infective appendicitis are the ones over which the most warfare has been waged during the past fifteen years, and the questions of diagnosis and prognosis have been reduced to the point of scientific accuracy. The symptoms in an acutely progressive case of true infective appendicitis are generally so well defined that it is unusual for good observers to make an error in diagnosis.

The point of primary importance is gained by palpation; the rigidity of the muscles of the abdominal wall is such a salient feature that we practically need never expect to find a case in which this symptom is absent. The rigidity of the muscles of the right side of the abdomen is often greater in degree than upon the left side at the outset of an acute attack. Pressure with the fingers over the region of the
appendix elicits the fact that we have an unusual degree of tenderness at the site of that organ. It is quite true that the appendix may be abnormally situated, but in practically everyday work we may expect to find it in the right iliac fossa. These two features, rigidity of the abdominal muscles and distinct local tenderness on pressure over the appendicittal region, are practically all we need in making a diagnosis of acute infective appendicitis; when our attention has been toward the patients abdomen by the various symptoms, the acute inflammatory processes of the hollow viscera of the abdomen. One hears a good deal about mistaking inflammation of the ovary or Fallopian tube for appendicitis, but this can rarely occur if one depends upon palpation for making his diagnosis, excepting in cases which do occur of simultaneous involvement of the appendix and uterine adnexa in an acute inflammatory process. We hear of cases of duodenal ulcer, of gall-stones and of nephritic colic having been mistaken for appendicitis, but it is probable that in such instances sufficient attention had not been given to the matter of careful palpation of the appendicittal region.

When directed by a properly trained brain, the finger which possesses a refined sense of touch can obtain from the pulse information of inestimable value concerning the most important function of life. Healthy life is dependent upon a regular and uniform circulation of blood, and must follow any considerable or continued variation in this function.

In describing the pulse, Prof. Huxley, in his "Psychology and Hygiene," said: “If the finger be placed upon an artery, such as that at the wrist, what is termed the pulse will be felt; that is to say, the elastic artery dilates somewhat, at regular intervals, which answer to the beating of the heart. The pulse which is felt by the finger, however, does not correspond precisely with the beat of the heart, but takes place a little after it, and the interval is longer the greater the distance of the artery from the heart. The beat of the artery on the inner side of the ankle, for example, is a little later than the beat of the artery in the temple.

“The reason of this is that the sense of touch by ginger is only delicate enough to distinguish the dilatation of the artery by the wave of blood, which is driven along it by the elastic reaction of the aorta, and is not competent to perceive the first shock caused by the systole. But, if, instead of two fingers, sufficiently delicate levers were made to rest upon ay two arteries, it would be found that he pulse really egins at the same time in both, the shock of the systole making itself felt all over the vascular system at once; and that it is only the actual dilatation of the arterial walls, which, traveling in the form of a wave from the larger to the smaller arteries, takes longer to reach and distend the more distant branch.”

Whilst the heart is the center and principal source of power of the circulation, every vessel does its part in aid of the movement of the blood. We have, therefore, to determine by the pulse the condition of the heart, the condition of the arteries, the condition of the capillaries, and to some extent the condition of the veins. As these movements are stimulated and co-ordinated by the sympathetic nervous system, it should also tell us of the wrongs of innervation. As the movement of the blood depends, to a certain extent, upon organization and- condition, it may also determine for us the wrongs of this fluid.

We will probably study the pulse to better advantage if we analyze it and think of its elements separately. Put your finger on the radial artery and carefully observe the movement. It first divides itself into: (a) a dilatation of the artery, and (b) a succeeding contraction.

The wave of blood forced forward by contraction of the ventricles gives us the arterial dilation. Whilst the contraction of the artery may represent the subsequent filling of the ventricles from the auricles.

To this extent the pulse evidences the time of contraction, or the rapidity of the heart-beat. Even to this extent the information is important, for a healthy life can only be maintained when the movement of the blood is well timed. If the heart beats too rapidly, we must have a wrong in life, as if it beats too slowly we will have a wrong in life.

With regard to frequency in pulse, we are in the habit of saying: As is the frequency so is the impairment of all the vegetative functions - of the appetite, digestion, blood-making, nutrition, excretion from skin, kidneys and bowels, wrongs of the blood, the activity of zymotic poisons. There may be exceptions to this general rule, but it is so constant that we find it important to act upon it in every case of disease. Given frequency of pulse, the questions at once suggested are: What is its cause? What is the remedy?

Whilst frequency of pulse suggests to us the use of that class of remedies called sedative (special or arterial sedatives), they will not always answer our purpose. If the wrong be purely one of the circulatory apparatus, functional in its character, and depending upon a wrong of sympathetic innervation, these remedies will probably be sufficient. But if the frequency of the pulse represents and is dependent upon some other lesion. as of the blood, or local disease, then other and different remedies may prove the sedatives.
Frequency of pulse is associated with frequent respiration. The proportion is usually four beats of the pulse to one respiration. The relation of frequent respiration to various wrongs of function will be known to the reader, and evidently a slower respiration is something to be desired in all cases of disease, and something that must be obtained in some cases if the patient recovers health.

Without reference to the undue general excitation that comes from frequent respiration, and the exhaustion that must follow this severe muscular work, attention should be called to the marked wrong it must work in diseases of the apparatus. Rest is an essential to recovery in all diseases of excitation, and in most diseases of structure. With a rapid pulse we cannot have rest of the respiratory apparatus for the movement of the chest is related to the movement of the blood. Make the pulse go slow, and the movement of the chest is likely to be slow in proportion.

The relation between the frequency of pulse and the temperature will be borne in mind. For each increase of ten beats per minute of pulse there is an increase of one degree in the temperature. Thus, with a normal circulation of 72 beats per minute, and a normal temperature of 98° we will find an increase of pulse to 90 will give a temperature of about 100°; with an increase of pulse to 120, we will have a temperature of 103° and so on.

This rule does not hold good in all cases, possibly not in the majority, for the high range of temperature from to 103° to 108° does not carry the pulse up proportionately.

When we come to consider the influence of changes of temperature we find them similar to those that follow change in the time of pulsation. In the ratio of increased temperature we find arrest of excretion, of nutrition, of digestion, of blood-making, and of innervation, and that zymotic poisons propagate themselves more rapidly. With the temperature maintained above 100° F., death a matter of time; indeed, molecular death is going on from the time the temperature strikes this point.

It was mentioned that local processes of diseases are severe in proportion to the frequency of the pulse. This will be noticed especially in inflammation: as is the frequency of the pulse so is the intensity of the inflammation, the impairment of the life of the part, and the danger of a termination in death. The local hyperemia is increased by the rapid pulse, and the final arrest of circulation is also promoted by it. If, therefore, we wish to stop the process of inflammation, we select those remedies which will lessen the frequency of the pulse.

If in any case we have a structural lesion, whatever may be its nature—either all impairment of nutrition or from deposit—we will find, frequently, that its progress will be in proportion to the rapidity of the pulse. In these cases remedies that influence the circulation, giving it normal frequency and freedom, will be very important.

It was also stated that zymosis or sepsis was rapid in proportion to the frequency of the pulse. This may be noticed in those diseases known as typhoid, in erysipelas, the eruptive fevers, diphtheria, as well as in typhoid and typhus fever, as is the frequency of the pulse so is the evidence of sepsis as marked by dirty, brown or black coatings on the tongue, sordes on the teeth, pungent heat, offensive discharges, etc. The danger to life is frequently in proportion to tile frequency of the pulse, and means that will give a better circulation as regards time, freedom and uniformity in all parts of the body, lessen these unpleasant symptoms.

But frequency is only one of the wrongs of the circulation, and but a part of the information we should obtain from the pulse. Frequency has reference to the rapidity of the blood-waves—the number that passes under our finger in one minute. In addition to this we have to notice that there are peculiarities in the blood-wave and in the current after this wave has been passed. The pulse has volume—referring to the size of the artery. It has varying impulses in the wave of the blood, and also in the interval between the waves.

Volume, or increased size of the artery, may have reference to the amount of blood, to its increased circulation, or to some obstruction to its free movement. We will have a large pulse in the plethoric, we may expect a small one in the anemic, and these conditions will be determined by other evidences. If the artery is large, and the person is not plethoric, we ask the question: Is it dependent upon a more rapid movement of the mass of the blood, especially to the surface or is it dependent upon an obstruction to its movement through the capillaries?

Freedom in the pulse-wave indicates the one, and a want of freedom-oppression-indicates the other condition.

The sharp impulse of the wave of blood, as it strikes the finger, may be referred to lesions of the nerve centers, for remedies that relieve it. If the impulse be the wave short, and the inter-current vibratile, the irritation extreme short, and the inter-current vibratile, the irritation is extreme.

The dull, elastic stroke of the wave refers us to an impairment of innervation from the sympathetic and spinal cord. The more marked this is, the greater the necessity for those remedies which stimulate and give strength to these nerve centers.
The length of blood-wave reference to that condition known as “sthenia,” an excitation founded on strong life. This is especially the case where the wave is large in volume and well supported by the column of blood behind.

The oppressed pulse is marked by a want of power in the stroke, and more especially by a feeling as if the current in advance of the wave broke its force. Evidently the blood-wave does not measure the amount of blood passing the artery. It refers us to obstruction in the capillary vessels, or possibly an impairment of the large vessels as well, or a wrong in the blood unfitting it for circulation.

If the finger be carefully trained it will notice a variation in the surface of the wave, as well as in its length. Many times it is distinctly felt as two waves—a first, sudden and short, and a second, full, even and prolonged. The first may be called the shock-wave, and the second the systolic-wave, which represents the movement of blood from the heart.

The shock wave, sharp and pronounced, may always be referred to undue excitation of the nerves distributed upon the vessels, and an undue contraction or tension of their walls.

The full, strong, systolic wave may be referred to excitation of the heart and strength in its movement. The short wave evidences a want of cardiac power, and especially impaired innervation from the spinal cord and sympathetic.

The inter-wave current sometimes gives valuable information, and it is well for the reader to observe it carefully in health and learn its normal condition. We find in disease that it has more or less volume, has more or less strength, and has more or less of the vibratile quality.

When we speak of a full pulse, we have reference to the inter-wave current as well as to the wave, and the condition of sthenia will be determined by this. It is a strong life in a state of excitation.

If now we add hardness, we have added an especial lesion of innervation, of excitation steadily maintained.

If we speak of a small pulse hard, we refer it to impairment of life from activity, still maintained. If we have a small, soft, and easily compressed we refer it to deficient innervation.

If we have a small pulse vibratile, we say it is the expression of impairment, with great excitation of the nerve centers.

If we have an empty pulse, the inter-wave current hardly perceptible, it is evidence of impaired life, with enfeebled innervation from the sympathetic.

To the educated touch the pulse gives most valuable information with regard to the most important functions of life. Many physicians can locate lesions with great certainty from it alone; they can distinguish lesions of the brain, lungs, digestive apparatus, urinary apparatus, etc., and determine to some extent their character.

But in the practice of medicine there is something of more importance than locating a disease or even determining the character of a lesion. The important object is to associate the evidences of disease with remedies for their cure, and to make the expressions of disease to the medicine.

Feeling the pulse gives us a knowledge of the lesions of the circulation—most important in formation in the majority of diseases. Every lesion of the circulation is distinctly announced to the cultivated touch as are some lesions of the blood and of the nervous system. In so far as we here study the pulse, it is intended that it shall mean special remedies—not names of disease.

Frequency calls attention to a wrong of the circulation, and prompts the asking of the question, why? It does not necessarily mean veratrum, aconite, gelsemium, etc., though it is suggestive of them. Why? Is the wrong in the vessels an obstruction to the free circulation of blood, requiring an increased movement of the heart to compensate it? Is the wrong an enfeeblement of the heart, requiring increased frequency of impulse to compensate for want of power? Is the increased frequency dependent upon a wrong of the blood? Upon a cerebro-spinal wrong?

The full pulse with strength means medicine-veratrum. Whether full and hard, full and bounding, the special sedative named is at once suggested. It may not be all that the patient needs, but it is one thing, and in many cases will stand first.

The full pulse doughy (lacks the marked vibration) means lobelia; or if marked and associated with fullness of mucous membranes and purplish discoloration, Baptisia; or if accompanied with muscular pain, apocynum.

The full pulse open is kindly influenced by podophyllin, and especially by quinine in full doses. The large pulse empty calls for the alkaline sulphites, sulphurous acid, stimulant baths, or fatty inunction, quinine and histogenetic food. The sensation we get in this case is of an artery of large caliber, both with too little volume of blood, the sensation after impulse being of emptiness.

The full pulse vibratile calls for Gelsemium, usually associated with Veratrum.
The full pulse oppressed calls for belladonna, alternated with Veratrum, if sepsis, Baptisia or Echinacea, as indicated by the other symptoms.

The small pulse usually means aconite or ferrum phos.

The small pulse vibratile, aconite and Gelsemium.

The small pulse oppressed, belladonna and aconite.

The small, soft, easily compressed pulse, aconite and stimulants. Small doses of quinine with Crataegus and food.

The small pulse, frequent, easily compressed, the wave of blood giving a sensation of squareness as it passes under the finger, opium and Crataegus.

We have often reason to believe that quinine is indicated by the periodicity of the disease, and yet our experience with the remedy raises doubts of whether it will be well received and exert a kindly and curative action. If the pulse is hard and vibratile, wiry, we will not give it; if it is soft and open we may expect its kindly action. The physician who would administer opium or its salts with a hard, wiry pulse, would be doing his patient a great wrong. Here, also, we want a soft, open pulse for the kindly action of the medicine. No one in his senses would give podophyllin when there was a small, wiry pulse, or when it had a sharp stroke. The patient might get through safely, and it might kill him.

If the reader will notice carefully, he will see a marked resemblance between the touch of the pulse and the general sense of touch when the hand is applied to the skin. The sensation from the slight edema of cellular tissue that indicates apocynum, and the pulse that says apocynum, is wonderfully similar. The sensation from the skin that says lobelia and the pulse that says lobelia is the same. The pulse of Veratrum is associated with the skin of vratrum. And so we will find it all the way through, if we see the indications for remedies rightly they never conflict.

In an article on the character of the pulse and the information which can be obtained from a well-directed examination of the pulse, Pro. J.M. Fothergill says:

“The character of the pulse is the first thing to be observed. Whether it is full and incompressible, or feeble and obliterated by the pressure of the finger. When the arteries are full of blood the artery is not to be obliterated by moderate pressure during the diastole; that is, in the interval between the beats. A full pulse, then, means high blood-pressure in the arteries, i.e., the arteries are full.

When, on the other hand, the pulse is feeble, there is a comparatively empty artery, and the blood is mainly in the veins. A full pulse is a slow pulse, broadly speaking. A slack pulse is usually a fast pulse. The rapidity of the heart-stroke is regulated by the condition of the arterioles. The arterioles are almost entirely muscular as regards their walls, and their caliber is regulated by the vaso-motor nerves. When the arterioles are dilated, the blood runs freely in the arteries, the artery is slack and the heart beats rapidly. Such is the vascular system in fevers. In sthenic inflammations, ie., in inflammatory conditions in robust persons, the pulse is full, rapid and especially this is the case in acute thoracic inflammations, as pleurisy and pneumonina. In the latter disease, however, if both lungs become extensively implicated, the pulse will become small, weak, and often irregular, because the blood cannot pass freely through the lungs. When the pulse fails in pneumonia, and at the same time the heart is found beating violently, it indicates commencing failure in the right ventricle. A bounding, full pulse is the characteristic of acute inflammation of the thoracic viscera and of the meninges of the brain. But in abdominal inflammation the artery is contracted, fells like a pulsating wire, and is incompressible. Why there should be this marked difference is not very clear.

In peritonitis, the inflammation affecting the tunica vaginalis, there is this contracted, incompressible artery. It is of the utmost importance to be able to correctly estimate the pulse. Careful examination will often tell the form of heart disease under which the patient suffers. The 'splashing', 'collapsing' pulse of aortic regurgitation is quite characteristic. Irregularity of the heart's action is found in conditions of cardiac dilatation and in mitral disease, and especially when the two are combined.

Intermittency the pulse is of three kinds. (1) A simple halt or pause in regular beat; often a trick, and
nothing more, especially in young persons. It is, however, often found with evidences of degenerative changes in person advanced in years. Its significance depends upon its surroundings (2) A halt, preceded by a few rapid, feeble strokes, aggravated by effort. Here there is a dilated heart, with or without mitral disease. It is very significant; and it is very important to distinguish this form from the preceding one. Much misery has been caused unnecessarily by attributing to the first form the significance which attaches to the second form. (3) This is where the contraction of the left ventricle feeble that the impulse of the blood-wave driven into the aorta fails to reach the artery. The intermission may be isolated or in clusters; but if the ear be placed over the heart, its action will be found to be comparatively regular and rhythmic. Sometimes not half the ventricular contractions reach the radial artery. In cases of pulmonary embarrassment the pulse may be irregular and intermittent as a consequence of partial failure in the right heart. The amount of blood passing through the pulmonary circulation is insufficient to furnish a fair blood-wave into the aorta on the contraction of the left ventricle. The left ventricle can only pass onward what blood comes to it, and no more. This form of intermittency is best seen when a patient is sinking from some disease of the respiratory organs.

While the pulse flutters and intermits, and the flame of life is flickering out, the heart, and especially the right ventricle, will be head laboring away at its ineffectual task.

Disparity between the volume of the pulse and the energy of the cardiac contractions indicates enlargement of the right ventricle, except in cases of aortic stenosis.

Both radial pulses should invariably be felt. Sometimes there is an abnormal distribution of the radial artery, and it courses over the dorsal surface of the hand to the phalanges of the index finger. If it were made a regular practice to feel both pulses, this could not, as it sometimes does, lead to confusion.

I am not here going to describe the relations of the vagus nerve to the heart. It is enough for the present purpose to say that it contains various nerve-fibrils, some of which accelerate the heart’s action, while others slow it. These are called respectively, the accelerator and the inhibitory fibers of the vagus.

When the blood supply to the roots of the vagus nerve in the medulla oblongata is insufficient, the accelerator fibers are thrown into action, and the heart beats rapidly so as to pump more blood from the veins into the arteries. When, on the other hand, the roots are flooded with blood from well-filled arteries, then the inhibitory fibers are thrown into action, and the heart’s action held back. But this slowing of the heart’s action, the blood has time to escape out of the arteries through the contract arterioles before the next ventriculoful of blood is thrown into the arteries. If it were not for this last arrangement, rupture of the arteries, especially the cerebral arteries, would be much more common. Enough has been said in regard to the fibers of the vagus to show how the fast and slow pulse are brought about. It is very important that this broad division be clearly comprehended in daily practice, as it not only helps to clear up the diagnosis, but gives direction to the therapeutic measures. The slow, incompressible pulse indicates a totally different condition from the fast, small, compressible pulse. The latter may indicate debility or exhaustion, or it may be strictly nervous. When a patient is first seen, the pulse is apt to be very much accelerated, especially if the patient be nervous or exited. It is well, then, to feel the pulse at the end of the examination as well as at the commencement; the information furnished by the second examination of the pulse will often correct any erroneous impression produced by the first feeling of the pulse.

In many diseases the pulse mounts as death approaches; and when in severe disease the pulse becomes irregular as well as fast, the condition is fraught with imminent danger. It may become merely a “wobbling thread”, indeed; or at other times it is a “fluttering” rather than a rhythmic beat. In conditions of great debility, especially when brought on by hemorrhage, the pulse may become weak or irregular or intermittent, without much real danger. The examination of the pulse ought, then, to indicate careful investigation as to the associated general condition, and will often put the practitioner on his guard in insidious states. A persistingly rapid pulse of 100 per minute is regarded by many practitioners as a certain prodromic indication of commencing phthisis. It certainly is a symptom of evil omen, especially when found with actual lung mischief.

“One thing there is about the rapidity of the pulse which ought to be brought more conspicuously before the student than is done at present, and that is, the proportion between the rate of the pulse and the respiration. Normally the proportion is as four to one. If we regard normal respiration as 18 per minute, we get a pulse rate of 82 per minute. This is the proportion in health. In febrile and inflammatory diseases both mount, and we may have the respirations 30 per minute and the pulse at 120. Here the disturbances are such as to affect the respiration and the circulation alike. But when the proportion is disturbed it is most significant. If the pulse be rapid while the respiration is clam, it is
well to examine the heart to see if there be any dilation about it. Dilatation and debility in the heart will send up the pulse, without the respiration being necessarily affected. On the other hand, where there is thoracic embarrassment, the ratio of the respirations mounts up out of normal proportion to the pulse rate. This disturbance of the proportion will not tell what is the nature of the disturbing agent, of course, but it tells in distinct language that some abnormal factor is at work.

The cause may be emphysema, with or without some bronchitis; or a large portion of one or both lungs may be consolidated either in pneumonia or pulmonary phthisis, or there may be progressing congestion in acute disease. The student in the hospital ward is always taught carefully to examine the patients posterior thoracic regions when congestion is suspected, but this is not always convenient in private practice. A private patient has his or her own opinion and feeling which must be consulted, and cannot safely be ignored by the practitioner; and an examination of the back is disagreeably troublesome, and often repugnant to the feelings. It should not, therefore, be done without good and valid reasons.

If the practitioner were accustomed to take the rate of the respiration as systematically as that of the pulse, which certainly ought to be the case, a disturbance in the proportion would at once strike him, and put him on his guard. When the respirations commence to mount without a corresponding rise in the pulse rate, then the lungs should be carefully examined to ascertain the cause of the disproportion. So long as the normal proportion is maintained, the mind may be pretty easy as to congestion of the lungs. The correct timing of the respiration and the circulation is a most important matter, especially in thoracic disease. This matter should have more attention paid to it in the future than has been accorded to it in the past.

"There are nervous conditions which should be considered when both pulse and respiration mount up, and even the temperature may go up, too. Some physicians speak of being fooled by the temperature; but if one carefully examines his patient he is not likely to be led astray by the temperature.

"In pyrexia both pulse and respiration are accelerated, as well as the temperature raised. A fall in any of there is of good omen, as improvement in the other two follows. The pulse may be abnormally slow, either as mere idiosyncrasy, or in cerebral mischief, or in fatty degeneration of the heart.

"Then, again, the character of the wall of the artery is worth noting. Atheroma is a growth of connecting tissue in the arterial wall; either found in patches, and especially on points of flexion, as at the knee and axilla, or at the outer curve of the aortic arch; or a more general distribution, where the arteries feel more like tendons than normal blood-vessels. This condition is usually, if not always due to sustained high arterial tension. In time the artery feels to the touch elongated as well as broadened at each beat. This atheromatous change proceeds in two directions. (1) Towards fatty degeneration. and (2) calcareous change. The first is most common in the atheromatous patch, where the neoplasm softens and is washed away piece-meal in the blood-current, leaving an ulcer which is apt to become an aneurism. The latter change is more general. and in very marked cases the arteries feel as rigid as pipe stems. The atheromatous artery is a very important matter, from its associations with an hypertrophied left ventricle, contracted kidneys, and a waste-laden condition of the blood. Even when the left ventricle begins to fail. the atheromatous artery gives the impression of a good pulse-it exaggerates the pulse-wave so as to be very deceptive. The condition present may be one of temporary asthenia, and yet an atheromatous radial artery may create the impression that lowering measures are indicated.

"It has been said before that it should be the rule to feel both radial arteries simultaneously. By so doing, many an aeurism of the aortic arch would be detected which escapes observation.

"After pyrexia, inflammatory or other, a fan in the pulse-rate marks the defervescence of the malady. In feeling the pulse, it is well to let the ring and little finger tips trail over the palm. When this is wet and cold, it indicates expansion. not infrequently associated with disturbance in the reproductive organs. In hectic fever the hand is often very hot. In wasting disease the hand feels lifeless and limp. The hand often tells much as to the mental attitude, the amount of willpower, or want of it, in the patient. When presented in order that the pulse might be felt, it is well to feel the hand first, as a preliminary to feeling the pulse.

Among the evidences of disease none are more definite and important than changes in the temperature. Heat is not only force in the animal body, but it is also a condition of life; a man has activity through it and he has life by it.

The human body maintains its healthy functions at a temperature varying from 98° to 98.6° F.
This is a condition **absolute** for health. If the temperature varies to any great extent from this, above or below, disease must result. We may state the proposition in a different form: No disease can exist without changing the temperature of the body, either raising it, depressing it, or rendering it unequal. Thus, change of temperature becomes an absolute evidence of disease, though it may not point out the character or the location of the lesion.

The clinical thermometer is highly valued, because we appreciate the fact that the vital processes can only be performed in perfection in the normal temperature of 98° and that just in proportion as it varies from this, either above or below, they are changed or arrested. Indeed, it would seem that heat at this degree was the most essential condition of life and that, if there be a variation from it, those means which will restore the thermal equilibrium are the most direct and important.

The standard temperature of the healthy body is 98.6° and is subject to a slight variation during the day of about 0.820°. The maximum temperature is in the early morning; it fluctuates and gradually decreases during the day, and is lowest at midnight.

It has been shown that the amount of animal heat may be considerably altered by a number of collateral circumstances. But the great distinction between these alterations of temperature in health and those which are the result of disease is that these variations are generally temporary, and within narrow limits-amounting to mere fractions of a degree-rarely more than 1.8° Fahr. to 3.6° Fahr., whereas those which are due to disease are persistent so long as the disease exists.

In speaking of the normal heat of the human body, Dr. Aitken said:

"The following are the collateral circumstances which mainly influence animal heat in our daily life and require to be remembered in order that erroneous conclusions may not be drawn:

1) **Active exercise**, not carried to the extent of exhausting fatigue, raises the temperature proportionately to the degree of muscular exertion made. 2) **Exposure to cold**, without exercise, lowers the temperature. 3) **Sustained mental exertion** reduces temperature about half a degree. 4) The amount of heat is also reduced by a full meal and the use of alcohol, but it rises again as digestion advances. 5) There are diurnal fluctuations capable of being thus determined. 6) The temperature of the body rises with the temperature of the air: and sudden transition from a cold to a hot climate induces a feverish state marked by increase of temperature on bodily exertion. 7) The average temperature within the **tropics** is nearly 1°Fahr. higher than in temperate regions. 8) The temperature is more readily and rapidly affected-more sensitive, so to speak-than either the pulse or the respiration and this especially is the case in disease”.

We have to study both an increase in disease and a decrease in the temperature of the body, the first being of most common occurrence and having the greatest range. Thus, whilst a decrease of but one degree, if maintained for a considerable time, will result in death, an increase of two to four degrees may be maintained for a month with safety to life.

The increase of temperature is usually proportionate to the frequency of the pulse. In some adult males of good development an increase of one degree of temperature would correspond to an increase of ten beats of the pulse per minute. In the average adult, however, with a normal temperature of 98°, the pulse would be 70 or 80, and the increased frequency to each degree would be six or eight, until the 103° was passed.

In chronic disease we also find an increase of temperature, and the thermometer becomes almost as certain a means of diagnosis and prognosis as in febrile and inflammatory affections. Thus, for instance, in phthisis pulmonalis we find a permanent increase of temperature to 99° and 100° in the first stages, increasing to 101° and 102° as the disease progresses. This increase is so uniform that it will furnish the best evidence of the nature of the disease in its earliest stage. The frequency of the pulse corresponds to the increase of temperature. Breaking down of the tubercles is announced by a marked increase of temperature corresponding to the destruction of lung tissue and the danger to life.

In acute fevers and inflammations we find the temperature increasing in the ratio of the severity of the disease. It does not, however, remain uniformly the same throughout the twenty-four hours, but presents a marked morning decline and evening elevation.

This is very distinct, even in continued fever, which we are accustomed to think of as being uniform in all their phenomena. This fluctuation is rarely less than one degree, and is frequently two degrees or more.

The value of the thermometer as a means of diagnosis is thus estimated by Dr. Aitken:

"In the course of many diseases whose diagnosis has been accurately determined, if the temperature departs from its normal typical range, the thermometer will furnish the best and the earliest indication of any untoward event, such as the additional development of disease, or other visceral complications, in its course.

"When once the typical range of temperature (normal, as it were, of the particular disease) is
determined, a basis is laid for appreciating irregularities or complications in its course in particular cases. For example, a patient exhibits symptoms of fever of the typhoid type, but during the progress of the first week his temperature becomes normal, for however short a space of time - the occurrence this event proves that the fever is not what it was supposed to be.

Again, a patient may suffer from all the general symptoms of incipient pneumonia; but there is still a doubt as to whether infarction of the lung has taken place. The sputa being suppressed, or not procurable, does not assist the diagnosis. If, however, the temperature is found to be normal, it is certain that no croupous exudation has taken place in the lung, and that there is no pneumonia.

Again, if a tuberculous patient has a sudden attack of hemoptysis, and if the temperature of his body is normal during and subsequent to the attack, no reactive pneumonia, nor any exacerbation of the tuberculous exudation, need be expected.

Again, in all cases of convalescence, so long as the defervescence proceeds regularly as measured by the temperature, no relapses need be feared; on the other hand, delayed defervescence in pneumonia, the persistence of a high evening temperature in typhus or typhoid fever, or the exanthemata, and the incomplete attainment of normal temperature in convalescence, are signs of great significance. They indicate incomplete recovery, supervision of other diseases, unfavorable changes in the products of disease, or the continuance of other sources of disturbance requiring to be carefully examined into. The onset of even a slight elevation of temperature during convalescence is a warning to exercise careful watching over the patient, and especially for the maintenance of a due control over his diet and actions."

As has been stated, there is a constant relation between the frequency of the pulse and the temperature; that with a range of temperature of $103^\circ$ to $105^\circ$ we find a pulse ranging from 110-115 to 130-140. It is evident, therefore, that if we have any means that will control the circulation - lessening the frequency of the pulse - it will also lower the temperature.

The question then arises, if a treatment will thus control the pulse and temperature, may it not change a severe and dangerous case into a mild one without danger? We answer this question in the affirmative, not as a theory, but from observations of many cases of disease.

It should be distinctly understood that this statement refers only to those influences which can be continued for some days, and not to those which endure but a few hours. The use of large doses of veratrum will bring down the pulse from 120 to 60 or 70 beats per minute in six to ten hours, and with a corresponding reduction in temperature: but it is not possible to continue this influence, as in a few hours the stomach becomes irritable and rejects it, or the depression of the sympathetic nervous system is such as to imperil life.

But if the indicated medicine be given in small and frequently repeated doses, sedation is slowly produced, the stomach receives it kindly, and, instead of depression of the vegetative functions, the remedy acts as a stimulant to them.

It is conceded by many physicians that it is possible to arrest fever before it has run its course. Not that every case can be shortened, for in some the local lesion of Peyer's glands proves an insurmountable obstacle: but many can be arrested from the seventh to the ninth day, more by the fourteenth, and in nearly all, the disease can be restricted to twenty-one days.

A fever terminates naturally by a decrease in the frequency of the pulse, a diminution of the temperature, and the re-establishment of the secretions, by which the cause of the disease is removed. If, then, by the use of sedatives, we lessen the frequency of the pulse, and obtain an equal and uniform circulation, with a corresponding decline in temperature, we find it easy to establish secretion from the skin, kidneys and bowels by the usual means. And in a majority of cases these processes may be sustained by the use of nutritious food and the use of small doses of the bitter tonics.

The temperature has the same relation to chronic disease, and the treatment influencing the temperature will have a like influence. As an example we may adduce phthisis pulmonalis, one of the most intractable diseases we have to contend with. In this, so long as the temperature is maintained, the disease progresses and very frequently its rapidity is in exact ratio to this. Diminish the temperature and the disease progresses more slowly. Reduce it to $98.6^\circ$ and maintain it at this, and the patient rapidly improves.

The wrong of temperature is but the expression of disease. If the disease is favorably influenced by remedies, the temperature falls or rises toward the normal standard. Thus, in a given case of disease we may see the pathological wrong, whether in the blood, the nervous system, or of waste and excretion, and at the same time the indications for the remedy which will right the lesion, and we know that its use will reduce the temperature.

Thus, in a case of zymotic fever the evidences of sepsis are marked, and with sepsis - there must be an exalted temperature. If now we select the right antiseptic, say sulphite of sodium, chlorate
of potassium, echinacea or baptisia, the temperature will fall with its use. If in any given case we have a special indication for nitric acid, for podophyllin, quinine, etc., they will influence the temperature toward the normal standard.

But in many cases the wrong of temperature may be regarded rather as a cause than as a result. If the temperature is above the normal standard the functions of life are impaired in the ratio of the excess. Thus, as we have already seen, increase of temperature is associated with acceleration of the pulse; increase of temperature is associated with frequent respiration, with an increase of temperature there is an arrest of digestion, blood-making, nutrition, waste, retrograde metamorphosis, and secretion from skin, kidneys and bowels. We also find that structural lesions are influenced in the same manner. Inflammation is active in proportion to increased temperature, as is also the tendency to suppuration and death of the part. The influence of zymotic causes of disease is also increased in the ratio of increase of temperature, and the condition known as typhoid is marked in proportion to it. In surgical disease we find the processes of repair arrested when the thermometer marks 103°; above this the pus loses its laudable character, becomes thin, ichorous, etc., and presently the structures soften and break down.

The fact that increase of temperature is a condition in many chronic diseases has already been noticed. In phthisis pulmonalis the first advent of the disease is announced by a temperature of 100°. In morbus coxarius, white swelling, etc., increase of temperature is one of the most pronounced distinctive symptoms. In all these cases we may say that the rapidity of disease is in the ratio of increased temperature, and so long as the temperature is thus high no amendment need be expected. If the temperature can be reduced and maintained at or near the normal standard, the destructive processes are less active, and a cure rendered possible.

If we decide that a wrong of temperature is a cause rather than a result, even though but in part, we wish to know the means by which it may be rectified.

The first proposition—"as is the pulse so is the temperature"—gives us the use of the very important class of remedies - the special sedatives in small doses. If these remedies exert a direct influence in giving a slower and better circulation, they will also lessen the temperature. Certain remedies especially influence the temperature through the nervous system, as rhus, gelsemium, bryonia, belladonna, nux, nitric acid, etc. Others influence it through the constitution of the blood as alkalies, acids, food, etc.

Then, again, we look to the skin as the regulator of heat in the body. It is possible that a wrong in the condition of this apparatus is the cause, in whole or in part, of this lesion. What is the condition of the skin? Is it dry, constricted, full, relaxed? What remedies, in the form of baths or otherwise, will right these wrongs?

If we take the simple lesion of excess of temperature and frequency of pulse, as seen in febricula, we will usually find a cure in small doses of ferrum phos. and kali mur. In many cases with a dry and constricted skin, the sponge baths are found to place the organism in better condition and lessen the temperature.

If a bath is indicated, we select it as we would the internal remedy. If an alkali is indicated internally by pallid mucous membranes, it will be found best for a bath. If an acid is indicated by deep coloration of mucous membranes, we employ an acid bath. If the skin is relaxed and enfeebled, we think of stimulant, tonic or astringent baths. We employ fatty inunctions in two conditions—when the skin is dry and constricted, and when it is relaxed and enfeebled.

In both the junction answers a good purpose. In some cases we combine it with a stimulant or one of the essential oils: in others we make it a vehicle for the topical application of quinine.

If the increase of temperature is associated with waste of tissue, we find it important to provide a better fuel for burning, and thus allay the excitation caused in destruction of tissue.

Thus, in chronic disease we think of olive or cod oil, and foods that contain calorific material in excess, and that are at the same time easily digested. In acute disease we furnish similar kinds of food, whilst at the same time we modify the process of combustion as much as possible.

In depression of temperature we find every function of life impaired, but in this case the lesion is always of depression, whilst in the preceding it was most frequently of excitation. It requires but a slight fall of temperature to impair and finally arrest functional activity.

In some cases of chronic disease we find a slight depression of temperature as a part of the lesion. At once we ask the question—what is the cause? Is it dependent upon want of food or of proper food? A wrong of digestion? An impairment of the respiratory function and of combustion? Or a wrong of the skin, so that it presents a rapid escape of heat? On the answer obtained to these questions will depend the treatment. If it is a want of food, or of calorific food, a right treatment will look to the selection of appropriate kinds. If we find a lesion of digestion, either buccal, stomachic, or
intestinal, means to rectify these lesions will be demanded. If it arises from deficient respiration, we will direct such exercise as will call into activity the respiratory function and facilitate combustion. It is possible there may be a defect in certain materials that favor combustion. In some cases there is a want of phosphorus, and its administration will at once restore the calorific function. In others it may be of sulphur, or of sodium or in some cases it would be met by cod oil. Wrongs of the skin permitting the escape of heat, are readily recognized by the touch, as evidences of relaxation, or exudation of water from the blood, or hyper-activity of the sudoriferous glands. The remedies will consist of stimulant and tonic baths or sometimes the use of fatty inunction with stimulants or with quinine.

An irregular or unequal distribution of heat is a source of trouble, as well as its increase or diminution.

If we have too much heat in one place and too little in another, we will find associate wrongs of circulation and innervation, and there will be impairment of digestion, blood-making, nutrition, waste, retro-grade metamorphosis, and excretion. Wrongs of the blood are likewise increased, and there is the tendency to deposits of imperfectly formed albuminoid material. Local diseases are also more severe, and the tendency to structural changes more marked. In chronic disease we will frequently find that an improvement takes place until the wrong of temperature is rectified. Getting well may hinge on getting the feet warm. With cold feet, remedies which seem adapted to the case continually fail; warm the feet, even by sprinkling a minute quantity of capsicum in the stockings, and the patient improves at once. In some of these cases, topical means will be all sufficient, but in others we will have to employ such as give strength to the circulation and improve innervation.

In acute disease unequal temperature is one of the most unpleasant symptoms met with, and it is always looked for in the advanced stages of severe disease. If one applies the hand upon a surface from which a sinapism has been recently removed, a peculiar sense of "pungency" is experienced. Quite as distinct a sensation comes in severe scarlet fever, in malignant rubeola; and in diseases characterized by the symptoms known as typhoid. We get a similar pungent heat when there is great excitation of the sympathetic and spinal nervous systems.

We may say, then, that this character-pungent heat-which is so readily recognized by most persons, refers us to lesions of the blood-sepsis, and to lesions of the nerve centers-excitation. We at once think of antiseptics as appropriate remedies and select the particular one indicated by the symptoms. In so far as the nervous lesion is concerned, we will be guided in the selection of remedies by the facial expression and the pulse.

It is possible many times to determine the character of a local lesion by the sensation given the hand. Thus, one very readily recognizes the peculiar pungent heat of erysipelas, and sometimes the touch will determine the advent of this lesion in surgical disease before the eye would recognize the change of color or the intumescence of tissue. The hand placed upon the abdomen will feel the advent of puerperal inflammation before it will be recognized by ordinary symptoms. There is very much to be learned in this regard, and it is well to give it thought and experiment.

In one of his lectures, Prof. J. M. Fothergill in part, speaks as follows of the importance of a close observation of the temperature of the human body in disease:

"The temperature may be below normal in cases of collapse, in deep alcoholism, or in embarrassment of the respiration. In disease of the respiratory organs a fall in the temperature is often a most grave matter; indeed, there are times when a high temperature is a matter of much comfort, and a sudden fall of the temperature is undesirable.

"The clinical thermometer is one of our most valuable means of examining our patients. It is not however every practitioner who yields a clinical thermometer skilfully, more than a stethoscope. It is easy to put either to the patient's body, true, but after all the instrument is valueless or valuable according to the brain that superintends the operation.

The most delicate or requisite instrument cannot illuminate a defective or imperfectly educated mind. After all, it is not an instrument that knows! Some men act as if they thought that if they could only secure a perfect instrument, it would do away with the necessity for knowledge, and abolish the need of thought. It would do all for them. This is so obviously absurd that it would seem a superfluity to allude to it; if it were not so prevalent it would be quite unnecessary to refer to it.

"In order to wield the clinical thermometer intelligently and to comprehend the information afforded by it, the student must fully realize the fact that a high body-temperature may be produced by (1) imperfect heat loss; or (2) increased heat production; or (3) both combined.

"For successful treatment it is of the highest importance to determine how the pyrexia is brought about. When the skin is dry and still more when it is burning as well, then there is defective heat loss par excellence, whether there be any increase of heat production therewith or not. In rising fever there perspiration. Heat is radiated away from the body by the vascularity of the cutaneous area,
and still more by the cooling effect of the evaporation of the water of the perspiration. Sustained effort leads to sweating. In effort more body-heat is produced than in quiet; and this increase in heat production is followed by increase in the perspiration with resultant increased heat. Thus temperature equilibrium is maintained. In rising fever all perspiration is arrested, and the exhalation of heat from the burning skin is insufficient to keep down the temperature. Consequently high temperatures with a dry skin are not so serious as equal temperatures with a wet or moist skin.

When the skill is wet, showing great heat loss, a high temperature indicates greatly increased heat production. Here, in spite of an abnormally great heat the temperature keeps high. In taking the temperature the condition of the skin should be carefully noted. When wet, the rise over the normal temperature is of much greater gravity than when there is a dry skin. This fact should never be overlooked.

"In many cases there is a certain amount of increased heat production, as in local inflammation, with a certain diminution in the heat loss from inactivity in the sweat glands.

"A rapid rise of temperature is more common with children than with adults. The younger the organism the more unstable and mobile are its heart-regulating processes. A rise of two or three degrees Fahrenheit in a child is of little moment, but in a person over sixty it should be thoughtfully regarded. A rise to 103° or 104°, or more, in a child often indicates acute indigestion. The more the rise the less serious the indication.

Fever of an important nature usually rise slowly, and often take days to reach a temperature attained in dyspepsia in as many hours. The term hyperpyrexia (that is, a temperature above 105°) is applied to conditions where an abnormally high temperature suddenly increases. It is always a serious affair.

"When the temperature reaches 107° the patient's life is in danger; at 108° it is in extreme danger; at 110° the prospects of life are nearly blotted out. A very few cases of survival after a temperature of 110° are on record.

"So long as the morning temperature keeps near normal, a rise of a few degrees in the evening does not alarm one. But when the morning temperature mounts and approaches the evening temperature, the prognosis waxes gloomier. On the other hand, when the morning temperature drops, and there is a distinct gap between it and the evening temperature, then the outlook is brightening. Often a rise or fall in the temperature heralds a coming change, of which it may be the first outward sign.

On the other hand, the student must know that at times rapid rises of temperature are nervous in origin, in fact, 'true neuroses.' In one case which came under my notice, in a very nervous girl, for months the temperature, when taken, was over 103°. This rise was accompanied by increased rapidity in the respiration and the pulse. Yet she was sinking of inanition, and never approached the typhoid condition which is many times the consequence of a sustained high temperature, nor gave any indication of persisting fever. Once the temperature, when taken, was over 104°, yet she was not at all 'feverish'; it was just excitement, and too evanescent to produce any distinct consequences."

In advising young doctors to examine their cases with care, and to never overlook unusual causes of high temperature, Dr. Austin Flint says:

"The physician is liable to be misled by placing too much reliance on the laws of temperature. They are not infrequently interfered with by complications and accidental events. As an illustration, a young girl had passed through typhoid fever, convalescence being declared, in connection with other symptoms, by the laws of thermometry belonging to the decline of fever or defervescence in this disease. Suddenly hysterical symptoms were manifested, and the temperature rose to 105°. The physician, a man of learning and large experience, was naturally alarmed. In a few hours, however, the temperature declined, and recovery took place without further impediment.

"With regard to the information furnished by the thermometer, as well as other diagnostic symptoms, it is to be borne in mind that there are exceptions to rules which are generally applicable. It is in the female sex that these neural disturbances are usually manifested. At the catamenial week of the menstrual cycle, temperature perturbations are common, and a pyrexia, for which there is no apparent cause, may at these times cause unnecessary alarm."

A sustained high temperature ever causes anxiety, as it melts down the body tissues and endangers life from the accumulation of the products of nitrogenized waste in the blood.

CHAPTER IX.

DIAGNOSIS BY THE SENSE OF SMELL.

The sense of smell possessed by some men is very acute, and is sufficiently developed by most men to give it more or less diagnostic value. A little time and thought, however, given to the cultivation of this sense will markedly develop its power of differentiating odors, and thus enable the physician to readily determine the probable influence of their causes upon the human body. But
whether we can distinguish one bad smell from another or not, we know one thing, that they demand cleanliness, good ventilation, and a restorative treatment. Going one step further, they evidence the condition of sepsis or zymosis, and demand that we select the proper antiseptic. If we can select it from the odor, good; if not, and in any case, we have other expressions of disease that will point out the particular remedy required.

If we apply the sense of smell to the excreta, we find it of some value, though possibly not of very much. The cutaneous excretion gives a distinct odor, and in disease we sometimes find marked changes in this. It is not difficult to recognize the pleasant odor from the healthy skin, kept clean, as it is not to recognize the odor of the person kept dirty. In treating children the evidence of our nose is frequently opposed to the evidence of our eyes.

The child seems clean, but the unpleasant odors tell you to look beneath the surface, and it is dirty. We find all manner of odors from the person, running the range of "from grave to gay," and they tell the story of disease and vitiated secretion. Some of these are so characteristic that they cannot be mistaken, as, for instance, the peculiar urinous smell in tinea capitis.

The urine has a distinct odor, that may be called healthy. It may lose odor, or it may have a wide range of morbid smells, each of which should have a distinct significance. The seminal odor is so distinctive that it can hardly be mistaken, and, as it is very persistent, and may pervade the entire person, it will sometimes give important information. So, too, is the odor from the sexual organs of both male and female, in certain cases of disease.

The fetor of the feces is peculiarly unpleasant, yet the odors are distinctive, and would suggest health in one case and disease in another. There is a sweetish, mawkish, unpleasant odor, similar to that exhaled from smallpox, which demands the use of sulphurous acid as plainly as it can be expressed in words. It may be sprinkled on the floors, and the chamber utensils may be washed with it. This not only gets rid of a bad odor, ut it removes a cause of disease.

There is a peculiar odor of putrescence which suggests the use of chlorine, phenol or iodine. We use a solution of phenol as a wash for things that are soiled, or as an application to wounds, and a change soon takes place.

There is a bad odor that simulates the offensive sputa of chronic bronchitis and some cases of phthisis, which indicates iodine, and we use it as a disinfectant, a dressing, a local application, or as an inhalation. So, too, there is an unpleasant odor peculiar to phlegmonous erysipelas, that calls for permanganate of potassium so plainly that no one need mistake the remedy. A sweetish or mawkish odor from the breath is an indication for sulphurous acid or sulphite of sodium. An odor resembling an offensive lochial discharge is an excellent evidence of the need of chlorate of potassium. The hot breath, with an unpleasant pungence, as of ammonia, calls for muriatic acid. The fetor resembling that from cynanche maligna suggests the use of baptisia.

In the exanthemata a certain animal odor, often amounting to a positive stench, is emitted. Certain lunatics, and markedly paralytics, possess a very disagreeable odor, so strong at times as to have a diagnostic value. In pyemia the breath carries with it a characteristic smell, often described as that of hay or earth. In gangrene of the lungs, and in ozena, the breath is very offensive. In stomatitis the breath is very unpleasant, and in some fevers there is a mouse-like odor. Many persons have an offensive breath when the bowels are neglected, and also when suffering from indigestion.

CHAPTER X.
SECRETION IN DIAGNOSIS.

It may be well, before considering secretion as a factor in diagnosis, to refresh the memory in regard to the processes by which secretion is brought about and maintained.

Saliva.

In the absence of an inciting cause, very little saliva is secreted, only sufficient being poured into the mouth to keep the surface moist. When, however, food is placed in the mouth, and the process of mastication begins, the secretion goes on more or less rapidly, according to the stimulating or non-simulating character of the food being masticated.

The activity of the salivary gland is brought about by means of special nervous agencies when a stimulus is applied to the mouth. The nervous mechanism which controls secretion is what is known as a reflex act. The stimulus, traveling from the surface of the mouth to the nerve centers, is reflected then to the glands. The nerves controlling this reflex act are spoken of as afferent nerves, which carry them from the centers.

If we remember the circumstances which commonly give rise to a flow of saliva, we shall have
no difficulty in determining the nerves which act as the afferent channels in this simple reflex action.

Stimulation of the mucous membranes of the tongue and mouth, whether chemically, as with irritating substances, or mechanically, as by the motions of chewing, is generally transmitted to the center by the sensory branches of the fifth cranial nerve, which supply the mouth, and by the glossopharyngeal.

The stimulus of the sense of taste is sent by the nerves of that sense, mainly at the glossopharyngeal, to the taste center in the cortex cerebri, and from thence to the secreting center by means of intercentral fibers.

The stimulating of the olfactory region with certain odors induces salivation through a channel of a similar kind passing along the olfactory nerve to the brain, and thence to the special emotion, may be excited by seeing or thinking of food, and may cause activity of the salivary glands. Here the intercentral channel is the only one occupied in carrying the impulse to the special secreting center.

Irritation of the gastric mucous membrane stimulates the salivary glands as may be seen by the sudden flow of saliva which commonly precedes vomiting. In this case the impulses are carried by the gastric branches of the vagus.

Many drugs, when introduced into the blood, cause a flow of saliva. Among these pilocarpine and physostigma are perhaps the most prominent, while atropine and some others, on the other hand, check the action of the glands. From this fact we learn that the nerve center controlling the activity of the salivary glands may receive impulses from many distant and diverse nervous sources, or may be influenced directly by the quantity of the blood flowing through the special nerve center itself.

The channels traversed by the efferent impulses going to the salivary glands have been demonstrated by experiment. In the case of the submaxillary, the route is especially distinct and instructive, so that from this gland we obtain most of our knowledge concerning the direct influence of nerve impulses on the gland cells.

There are two sets of nerves going to the salivary glands, one belonging to the sympathetic and the other to the cerebro-spinal system, both of which have been proved to exert a certain amount of influence on the action of the glands, the share taken by each apparently differing in different animals.

The sympathetic branches for the submaxillary and sublingual glands come from the plexus which embraces the facial artery, those for the parotid come from the plexus surrounding the internal maxillary as that artery traverses the gland. Both of these nervous plexuses are derived from the superior cervical part of the sympathetic nerve.

The cerebro-spinal fibers for the submaxillary and sublingual glands lie in the complex nerve known as the chorda tympani, which comes from the portio dura of the seventh and joins the lingual branch of the fifth. They pass thence through the submaxillary ganglion to the glands.

The cerebro-spinal parotid branches pass through the lesser superficial petrosal nerve from the tympanic plexus to the otic ganglion, and thence to the auricula-temporal nerve, which sends twigs to the gland.

In concluding this brief account of the processes by which saliva is secreted, it may be said that the center for the salivary secretion, which at ordinary times is moderately active, may be excited to energetic action by impulses coming from taste, smell and common sensory nerve terminals (particularly in the mouth), as well as by impulses which emanate from mental emotions.

Gastric Juice.

When the stomach is empty the secretion of the gastric juice is not large in quantity, but when the mucous membrane of the stomach is irritated with some chemical or mechanical stimulus, this secretion becomes quite profuse. The swallowing of alkaline saliva acts as a gentle stimulus, and causes secretion.

In the opinion of eminent physiologists, the secretion of gastric juice is under the control of a special nerve mechanism, and the way in which the state of activity follows stimulation of the part points to its being a simple reflex act.

In considering the chief elements of gastric digestion, it should be remembered that while the food is yet in the mouth the secretion of gastric juice begins, and is greatly increased by the arrival of a bolus of food and a quantity of frothy alkaline saliva. As the stomach is filled, more and more secretion is produced, and as some food is absorbed an additional stimulus is applied. Being kept in motion in a large quantity of liquid, which dissolves the cases in which the food particles are contained, the bolus of food soon falls apart, and each of its ingredients is fully exposed to the action of the gastric juice.
The acid reaction of the gastric fluid neutralizes the alkalinity of the saliva, so that the action of the ptyalin is hindered, and the starch granules float about quite unaffected by the pepsin or hydrochloric acid. The heat of the stomach (about 100° F.) melts the fats, and the motion breaks up the oily fluid into smaller masses. They are then mingled with the general fluid, which becomes more and more turbid, owing to the admixture of starch granules, fat globules, dissolved parapeptones and minute particles of partially digested proteids.

This dull-gray, turbid fluid is called chyme. The proteids (which class of foodstuffs is most profoundly affected by the gastric digestion) are changed more or less rapidly, according as their particles are small and uncovered, or large and massed together, so that they are more or less readily reached by the gastric juice, and also in proportion to the facility with which they form acid albumin. The chime contains but little peptone; so physiologists conclude that, when formed, it is rapidly absorbed, as are also the soluble sugar and ordinary fluids taken with the food. The chyme begins to leavepylorus soon after gastric digestion has begun, some passing the duodenum in about half an hour. The materials which resist the gastric secretion, or are affected very slowly by it, are retained many hours in the stomach, and the pylorus may refuse such materials for an indefinite time so that after causing much uneasiness, they are finally removed by vomiting.

However, many solid masses, unchanged vegetables, etc., escape through the pylorus when it opens to let out the chyme.

Bile.

The natural color of bile is of a deep orange-red, but by decomposition of its coloring matter it turns to a greenish-brown. It is transparent and more or less viscid, according to the length of time it has remained in the gall-bladder.

The secretion of the liver varies less in the quantity found in a given time than that of the other digestive glands. After food is taken there is a sudden rise, then a gradual fall, followed by a second rise in the amount produced. The secretion of bile is practically continuous. At the end of a period of fasting the gall-bladder is greatly distended, for the reason that secretion has continued to flow into the receptacle while there has been no call for its discharge into the duodenum.

The secretion of bile is considerably influenced by the amount of blood flowing through the organ. The variations in the rate of secretion may depend on direct nervous influence, as claimed by many physiologists, but no special secretory mechanism has been discovered for the liver.

Pancreatic Juice.

The duodenum as a digestive cavity in importance is second only to the stomach, for into it is poured the copious secretion of the pancreas and the liver.

The pancreas does not continue in a state of activity during the intervals between the periods of digestion. The secretion commences immediately after taking food, and rises rapidly for about two hours, then falls and rises again in the later hours of digestion, five to seven hours after a meal; then it gradually falls for eight to ten hours, and ceases completely when digestion is at an end. The first rise, which accompanies the introduction of food into the stomach, according to learned physiologists, is brought about by nervous agencies of a similar nature to that of the stomach, the secretion of which follows closely upon mastication. The second accompanies the passage of undigested food through the intestines, and may also be most conveniently explained as the result of reflex nervous stimulation of the gland cells.

The most important function of the pancreatic juice is the formation of peptone from proteids, which operation is carried out by a special ferment called trypsin. It has been found by investigators that this ferment can only be obtained from the active pancreas.

The pancreatic juice is, of all the digestive fluids, the most general solvent. It acts upon the three great classes of foodstuffs which require modification to enable them to pass through the barrier that intervenes between the intestinal cavity and the blood current. It changes proteids into peptones, it greatly modifies fatty substances, and converts starch into soluble sugar.

Intestinal Juice.

Very little is known of the nervous mechanism or the local cell changes which accompany the formation of the intestinal juice (by which is meant the fluid poured out by the innumerable short tubes or follicles of Lieberkuhn), but eminent physiologists believe that the secretion is under the control of some nerve center which can call the entire tract into action when one part is stimulated.

The observations as to the digestive properties of this secretion are very discordant, and outside
of the lines of this work.

Mucus.

Glands which are saccules lined with refracting cells, and, known as mucous glands, are the chief source of the thick, tenacious, clear, alkaline and tasteless fluid called mucus. These glands are distributed over all mucous membranes. This secretion contains about 5 per cent. of solid matters, of which the chief is mucin, the characteristic material of mucus.

Lachrymal Fluid.

The lachrymal glands secrete a thin, clear, colorless, alkaline to moisten the conjunctiva. This fluid commonly passes from the eye into the nasal cavity, and supplies the inspired air with moisture. The secretion is produced continuously in small amounts, but is subject to such considerable and sudden increase, that at times it cannot all escape by the nasal duct, but is accumulated in the eyes until it overflows to the cheeks as tears. The secretion of the gland is under nervous control, the impulses stimulating the secretion starting either from the periphery, and passing along the sensory branches of the fifth or along the optic nerve, or from the emotional centers in the brain, and arriving at the gland in a reflex manner.

In preparing the foregoing description of the processes by which the various secretions are established and maintained, the substance of material taken from Prof. G. F. Yeo's excellent "Manual of Physiology" has been extensively utilized.

The term excretion is commonly employed to designate a gland fluid the chief constituents of which are manufactured by other tissues, and are of no value in the body, but, on the contrary, require to be continually removed in order that their accumulation in the blood may not give rise to injurious consequences. These effete matters are the result of numerous chemical changes in the tissues, whence they are always collected by the blood and carried to the glands which preside over their elimination.

Secretion—one of the most important functions changed by disease—is a purely vital process performed through certain cells called secretory. In considering secretion in relation to disease, it is well, therefore, to keep continually in mind the fact that in the case of all the secretions there must be a membrane continuously giving birth to secreting cells, and that these grow to the normal stature of cells, withdraw from the current of blood the special material of their secretion, and then discharge themselves with it in the common duct.

Taking one step further, we find that function not only depends upon life, but upon the normal conditions of life. This is true of every part and every function of the body. Studying the life of cells—and secreting cells bear a very close relationship to formative—we find that a certain temperature, circulation and innervation are necessary. Probably the life of the secreting cell is not so much affected by changes of these as the life of the formative cell, but within a certain range it is so dependent; whilst the range is greater, the effect beyond certain points is just the same.

The cause of lesions of secretion may be general or local, and the diagnosis is made by an analysis of general symptoms influencing secretion at large, and symptoms pointing to local lesion of the secreting organs. When secretion in general is affected, we have good reason to think that the lesion is general; when but a single secretion is affected we have good reason to believe that the lesion is of the organ furnishing the secretion. When all the secretions are involved, the cause, as a rule, will be found in changes of temperature, circulation, innervation, digestion, blood-making and waste. If, now, secretion is to be restored to its normal condition, we want normal temperature, nor-mal circulation, innervation and waste, especially the first three. In a large majority of cases secretion is re-established so soon as the conditions of life permit, without the use of special means to this end. Thus, in acute disease, if means are employed to rectify the wrongs of circulation, the temperature and innervation, we find that the tendency is to a re-establishment of secretion as the conditions of health are approached.

Local lesions of the secretory apparatus are best classified as irritative and atonic, as it points out the classes from which our remedies are to be drawn. When a part is involved there will be, in nearly all cases, such unpleasantness of it as will call the attention of patient and physician to the wrong. It may be pain, or something less pronounced than pain, but it gives the special part a distinctive character separate from the general life. In health the body is a unit, and all sensations are pleasurable; in local diseases there is a feeling of separateness between the part and the life, and the severer the disease, as a rule, the more distinct this feeling which regards the suffering part as distinct from the life—a foreign body, which it would be well to get rid of.

It is true these subjective sensations are not always pronounced, and in some cases the suffering is so manifested that it seems of some other and distant part. Yet if the patient's attention is excited, he
readily determines the wrong sensation, and our knowledge of nervous distribution and sympathies
will soon translate the character and situation of pain.

Excluding neuralgia, acute sharp pain is the evidence of undue excitation and an active
condition; whilst dull pain and sensations of weight and dullness, indicate atony, with impaired
circulation and innervation. It may be said that this method of diagnosis too gross and arbitrary, but in
the majority of cases it will be as a good basis for the selection of remedies.

With this method, we should say the absence of local symptoms points to general disease, and
we carefully examine our patient with reference to the conditions of normal secretion. Fining the
wrong in temperature, circulation or innervation, we select from those remedies that influence the
particular function, and take that one which in its action is opposed to the disease, and in its influence
brings the functional wrong toward the standard of health. Determining a local wrong, we at once think
of those remedies that especially influence the organ or part, and take that one which in its action will
do that which favors the healthy life of the part.

Secretions is divided into two classes, excrementitiously and excrementitiously, and it is well
for the reader to have a good knowledge of these distinct form each other, learning the uses of each.
We want to know the simple facts with regard to the use of saliva, gastric juice, bile, pancreatic fluid,
and the small glandulae of the intestine in digestion, that we may weigh the wrong which may arise
form change in these secretions. WE want to know the value of mucus as a lubricant and protector of
mucous membranes, and of the sebaceous secretions as a lubricant and protector of the skin. And we
want to know the value of excretion from the lungs, the kidneys, the skin, and bowels, as a means of
removing worn out and effete material form the body. It is direct thought that we want, for when the
mind is directed to a single object if readily grasps it, but when it is made to embrace a multitude of
objects they become indefinite and indistinct.

If for example, we are called to a case of increased secretion of saliva, the diagnosis is easily
made, for the senses cannot fail to be impressed by the increased amount of fluid in the mouth. But the
questions that follow are not so easily answered: Is the increase from local disease of the salivary
glands? From disease of parts contiguous? From disease of the digestive apparatus below? From
disease of the brain? Or from a lesion of the sympathetic system of nerves?

It seems difficult at first to make such diagnosis, and yet as the mind considers one after another of
these, with such light as additional symptoms may throw on it, the problem is soon solved, and in its
solution we are directed to the particular class form which the remedy is to be selected, and possibly
the special remedy which will cure.

The example given above is one of the most complex, and we will find the others simpler. If we
take the secretion of gastric juice, we might make a different study. First, is the disease general, local,
or sympathetic? If the examination is carefully conducted, the absence of evidence of local disease,
and of parts with which the stomach is in special sympathy, and the evidences of general lesions which
might affect the stomach, will determine the first classification. But if the local symptoms were
pronounced, and there was wanting the evidences of general or sympathetic disease, we would have
determined the second classification. Whilst if we had pronounced disease of parts with which the
stomach sympathizes, as of the uterus or brain, but without marked symptoms of local or general
disease, we would have determined the third classification. It may be that we will find two or possibly
three, of those causes in some cases, but we reach our conclusions by these methods of examination
and thought.

If we take the liver as the next example, we will find it necessary to employ a different method.
The first questions we ask are with reference to local disease. Has the patient unusual sensations in the
right hypochondrium of pain, weight, distension, pressure upwards on lungs, toward the mesial line on
the stomach? Is there tenderness on pressure, sense of fullness when the hand is passed over the part,
or can the organ be felt below the margin of the ribs? Is there expression of disease from adjacent
parts, as from the bowels, stomach, lungs: Is there a wrong in the uses for while the bile is secreted?

In the present day it requires but little study in order to become convinced of the absurdity of
many of the old ideas in regard to the functions of the liver, and to reach the conclusion that the liver
does its work very kindly and well, and is an organ that aids nutrition, and not waste. If, therefore, we
find a wrong of intestinal digestion in which the liver is very surely concerned, we may look after the
condition of this organ.

The secretion is peculiar in color and sometimes wrongs of the liver may be determined by this.
Thus fecal matter is to some extent colored with vilipending, and if the color is dark, we say excess of
bile, if it is light we say deficiency of bile. This method of diagnosis is a little crude, for there are many
sources of error. Thus Lehman showed that the peculiar green stools following the administration of
calomel were not due to any action of that drug upon the liver, but to the presence of sulphate of mercury in the feces. An excess of acid may also produce green stools, as a deficiency may render them lighter in color.

The cutaneous pigment will provide a better guide than the color of the feces. The yellowness of jaundice will be called to mind as an instance, and many will recollect brownish spots—liver maculæ—that are very clearly traceable to the liver and its associate organs. But a change in the pigment less marked than this has a very definite meaning. It causes tawny coloration of the skin, giving it a dull, dirty appearance. This always points to a wrong of the chylopoieti viscera, especially to innervation from the solar plexus, and indicates the class of remedies that have been regarded as "liver medicines".

But the really important point to determine in these cases is the condition of the organ with regard to excess or defect in its circulation and innervation—is there excitation or atony? The symptoms are usually distinct so far as this is concerned, and the remedies will be clearly pointed out by the symptoms; but in this condition mistakes are often made. Take, for instance, a case of jaundice, in which the teaching in the past was to give hepatic stimulants, such as podophyllin, leptandrin, blue pill, calomel, etc., without reference to the condition of the liver. But in one-half the cases there are evidences of excitation in pain, tenderness on pressure, and accelerated circulation, increased temperature, dry skin and scanty urine.

Surely hepatic stimulants are not remedies here, and they usually do much harm instead of good. In such case the patient requires aconite, veratrum, selenium, acetate of potassium, or kali muriate, as indicated by the disease expressions.

In some cases, fomentations to the right hypochondrium are useful. In the opposite class of cases, with sensations of weight, fullness oppression, unequal temperature, etc., such drugs as will stimulate the liver and associate organs will prove remedies.

Again, we know in this connection that the bile pigment, when once deposited in the cutaneous tissues, is never removed by way of the liver, but is always excreted in principal part by the kidneys. In so far, then, as getting rid of the unpleasant coloration of skin in jaundice is concerned, we might just as well give a remedy to act upon the salivary glands as the liver. There are scores of these olden-time errors in practice that can only be gotten rid of by a careful study of physiology.

The pancreas does a most important work in secretion, one which the physiologist clearly understands, and yet we hear nothing about “pancreatic complaint”, “pancreatic disease”, or “touching the pancreas”. Indeed, there are no pancreatic remedies in our materia medica. Why is this? There is nothing like getting these substances fairly in view, that we may think of them. Lehman remarks: “The function of the pancreatic fluid in digestion may be two-fold, namely, to change starch into sugar, and to decompose the fats, so as to render them absorbable. That it actually performs the former in digestion, has been placed beyond doubt by numerous experiments. The pancreatic fluid possesses this property in a much higher degree than the saliva; it is operative at even a low temperature; neither bile, nor gastric juice, nor free acids, interfere with the function of the fluid”.

What, then would be symptoms of disease of the pancreatic secretion? Most surely they would be functional, and we would find them in imperfect digestion of calorific foods, a deficient supply of burning material, and a more or less rapid consumption of the fat stowed in the body. We would naturally expect to find unchanged starch and fat globules in the feces, and examination shows that this is the case. Just so soon as we begin to reason rightly we reach definite results.

But if we have no “pancreatic medicines”, how will we rectify these wrongs, after we have found them? This is also easy enough. There are in almost all cases certain lesions of the circulation, temperature, innervation, excretion, etc., which are easily recognized and relieved. When this relief has been secured by the judicious employment of the indicated remedy or remedies, normal secretion will be re-established.

In addition to the bile and pancreatic fluid, we have an intestinal fluid secreted by the “bottle-shaped” glands of the alimentary canal. With regard to this, Lehman remarks: “The intestinal fluid serves, as regards its function, as a compliment to the digestive fluids, which become inoperative toward the middle of the small intestine; it possess not only, as the latter of these does, the power of rapidly changing starch into grape sugar, but also of dissolving and rendering absorbable flesh and of the protein bodies. In tied knuckles of intestine, into which starch or paste has been introduced, all the starch is transformed into sugar at the end of three hours, and in a great measure absorbed. Pieces of meat or coagulated albumin disappear from such knuckles after six to fourteen hours.

As will be seen by the foregoing, the intestinal fluid is capable of doing almost the entire work of digestion, and it really does do a considerable part of it.
What we want to know, as a basis for a rational prescription in wrong of the intestinal glands is: Do we want sedation or stimulation? Do we want it of the circulation, or the innervation?-though these are usually associated. It is hardly worthwhile to point out now the special indications for amygdales, bismuth, mix, chelidonium, aconite, ipecac, nitric acid, podophyllin, etc., for their uses will be fully given in Part II of this work.

Mucus is secreted to lubricate and protect mucous surfaces, and in normal amount it favors the performance of function. Wrongs of the secretion are usually easily determined. If of the outlets of the body, the condition may be seen and felt. Thus, it is easy to recognize increased secretion from the nose, throat, and genito-urinary passages, from the abundant discharge. Increased secretion from the bronchial mucous membranes is known by its discharge, and also by the blowing and rattling sounds heard during cough and on auscultation. Increased secretion of mucus in the stomach is usually shown by the heavily loaded tongue at its base, whilst increased secretion of mucus in the intestinal canal will be shown by the uniformly dirty tongue and by the tumid abdomen.

Scanty secretion gives rise to irritation, and this is one of the prominent signs, and, taken together with the absence of discharge, is very good evidence.

With a wrong of mucous secretion we ask the questions: What are the general wrongs operative in this case? What is the condition of the mucous membrane as regards its circulation and innervation? It is a rule in practice to rectify any general lesions preparatory to the cure of local disease, and many times with this the local disease will disappear. Thus, in a given case of acute disease we have a frequent pulse, high temperature, and excited innervation, with dry mucous membranes; the use of the appropriate general remedies will establish secretion. And on the contrary, if secretion is too free, the use of appropriate general remedies will lessen it.

When we think of local remedies, we want to group (a) those which act upon mucous membranes, (b) those that act upon the special organ, part, or function involved. Having the classes of remedies before us, we now select a stimulant sedative, or one which by its action tends to change the character of the secretion or function. It is not difficult to select a local remedy if we know exactly what needs to be done, and we have a clear knowledge of the value of remedies.

A change in the sebaceous secretion frequently gives rise to cutaneous disease. If our attention is directed to the function of this secretion as a lubricant of the skin, its lesions will readily be detected. The treatment here will have reference to the condition of excitation or atony of the circulation and innervation, and to changes in the nutrition of the organ. Sedatives in the one case, stimulant and tonics in another, and remedies that alter morbid action in others, will be selected to meet the different cases.

A wrong in the secretion of tears, or the mebomian secretion, may occasion serious trouble with the eye. Profuse lachrymal secretion is sometimes a source of irritation, always a source of feebleness to the tissues. Scanty secretion, on the contrary, by leaving the eye dry, and without the protection given by this fluid, is a cause of irritation. The secretion of the meibomian glands serves an important purpose, and when in excess or defect, the function of the eye is impaired, and unpleasant disease may be grown.

Just so soon as the mind is directed to the parts which may be diseased, it is pretty certain, by direct symptoms or by exclusion, to determine the exact location and kind of disease. Then, knowing the action of remedies, local and general, these may be selected with reasonable certainty.

A wrong in the secretion of cerumen is a very frequent cause of partial deafness and many aural unpleasantnesses. It is surely well to know this, and by a careful examination determine the character of the disease-whether in excess, defect or perversion-and also the condition of the secreting structures as it regards increased excitation or atony. With such knowledge as may be readily obtained by any one the treatment of these diseases becomes successful.

The principal object in the consideration of these secretions is to call attention to the necessity of constantly keeping our physiological knowledge well in hand, and directing attention first to the use, that we may be able to understand the disease.

The excrementitious secretions are four in number-from the lungs, the skin, the kidneys, and the bowels-and these remove the waste of the body. The due performance of the function of excretion is essential to health, and in disease we invariably find a lesion of one or more. It the excretions are in excess, debility is the result and becomes a prominent symptom. If they are in defect, materials which should be removed are retained within the body, and result being irritation or oppression, according to the character of the material and the amount retained.

Excretion by the lungs is one of the most important of the excretions, being to the extent of 517 grains of carbonic acid per hour. In a rough estimate the value of these excretions may be written-lungs eight, kidneys two, skin and bowels each one. True, it is carbon which is thus excreted by the lungs, but a simple experiment in closing the mouth and nose of an animal will show that it will kill in a very
few moments.

Excretion by the lungs may be in excess, and this will be seen by the vivid redness of the blood where it reaches the surface, by the frequent, full respirations, an exalted circulation, an excited nervous system, a high range of temperature, and rapid waste of tissues. We find these evidences of excess both in acute and chronic disease, and it must be checked by the indicated remedies. Such a remedy as veratrum, and, to a less extent, lycopus, cactus, or sticta, must prove of great value in such cases, associated with such local and topical applications as relieve irritation and give rest. In the early stage of pneumonia with such symptoms, veratrum and a plaster of the compound powder of lobelia applied to the chest, may prove speedily curative, and in some cases of phthisis veratrum becomes a prominent remedy.

Defect in excretion from the lungs will be known by the darker color of the blood where it comes to the surface, the evident defect in the movement so the chest, fullness of superficial veins, and the oppression of all the functions from retention of carbonic acid gas.

At once our attention is directed to such remedies as prove excitant to this function, as nux, if there is deficient spinal innervation, phosphorus, arsenic, lobelia, bryonia, drosera, apopcynum, kali phose., etc. If by these means excretion of carbonic acid can e increased, the various functions of life are relieved from oppression.

Even if this knowledge did not point us to special remedies, it would be valuable as suggesting a proper hygiene. The patient suffering from excess wants quiet and rest, a moist atmosphere, and one not stimulating. The patient suffering from defect requires such exertion as will call into action the respiratory apparatus, a dry atmosphere, and one which is stimulating. Proper direction in these regards may be the one thing necessary to recovery, and we can only give such advice when we thoroughly understand our case.

The attention of physicians has been specially directed to the skin, kidneys and the bowels, as the apparatus of excretion, the importance of this function to health, and as a cause of disease. Careful study of these functions should be made, and their therapeutics improved.

This fact should be especially learned, that in a large majority of cases wrongs of excretion are dependent upon change sin general conditions of life-the circulation, temperature and innervation-and that when these are corrected the excretions resume their normal condition. Even when the function is not restored, very simple means are usually all that is required.

Excess in the secretion from the skin is readily determined by its moisture to the touch, dampness of the clothing, as well as by the patient’s sensations. The questions that follow are, Is it from excitation, or is it a result of debility? It rarely results from excitation in disease, though once in a while from increased circulation to the skin as in some cases of rheumatism, and in the so-called sweating fever, and some of the anomalous cases, this will be found to be the case. Here the diagnosis is quite clear-the skin has an active circulation, is deepened in color, and the temperature is increased. The increased perspiration of debility is not increased secretion, but an exudation of water, washing away a small quantity of albuminoidal materials. The condition is determined by the evident relaxation and loss of tone to the touch, the pallor, and usually the want of sensitiveness.

Evidently the treatment will be different in the two cases. The one of excitation requires the special sedatives, aconite, veratrum, selenium, or special remedies influencing the sympathetic nervous system, as the rhus, lycopus, etc. We want to relieve the undue excitation of the skin, and this accomplished, the sweating ceases. IN the other case an opposite treatment is required. Here we select such remedies as stimulate the skin - stimulant diaphoretics-and we are governed in our choice of remedies by the specific indications presented in each case. Or stimulants to the circulation-such as belladonna, bryonia, ipecac, etc.-may be needed. Local means will vary just as much, in the one case being sedative, in the other stimulant.

Defect in secretion may usually be known by examining the skin, which in one class of cases gives the hand a sense of dryness and constriction, and in another dryness with want of elasticity and life. The symptoms produced by retention of this excretion are first of oppression, terminating in chill, and second of excitation, giving the phenomena of fever. As will be seen, the general symptoms are somewhat indefinite, for both the oppression and stimulation may be the result of other causes. It is well to give due weight to this lesion, though we may not rest our entire practice upon it.

If the defect in secretion is due to an increased circulation and temperature, means to rectify these wrongs will stand first.

In a majority of cases of fever and inflammation, a right use of the special sedatives and proper baths will place the skin in such condition that it will resume its function, or that it can be called into action by very simple remedies. In other cases, where the wrong of circulation, temperature and innervation is
based upon other special lesions, the use of the special remedy for this is followed by a return of normal circulation, temperature and secretion. A marked example of this will have been seen in the administration of tincture of muriate of iron in some cases of erysipelas, as well as in the use of rhus when specially indicated.

If the defect is due to a want of excitation in the cutaneous nerves and circulation, remedies are employed which exert a stimulant influence upon the skin. Many diaphoretics owe their power to influence this secretion to their stimulant influence, and of course they can be beneficial only when a correct diagnosis is made, and they are rightly used.

Perversion of this secretion are not uncommon, but, owing to our imperfect means of diagnosis, are rarely recognized. “This fluid (sweat), as it collects in drops on the skin of one perspiring, is colorless, tastes salty, has a peculiar odor, is poor in solid constituents, and, when recent, always reddens litmus”. Yet we find in disease that is has color, sometimes to the extent of coloring the clothing, varying in shade and intensity; has a variety of tastes, sweet, sour, acrid; is rich in albuminoidal elements; and is sometimes neutral to test paper, and in other cases will change red litmus blue. Evidently here is a field that will repay investigation. Authorities upon skin diseases have recognized the fact that perversion of the secretion may be a cause of some of these, and may perpetuate the most intractable.

In so far as we know now, treatment will be directed to the physical condition of this organ, as shown by examination, and to lesions of the blood. The last are sometimes very important, for so long as there is in this fluid morbid material that is excreted by the skin, so long will the skin suffer.

Before leaving this subject it may be well to again call attention to the character of normal cutaneous secretion, and to the fact that, in so far as it is a secretion, it is affected by the secreting cells. In its normal state the skin has a uniform temperature slightly below that of the blood, gives to the hand a pleasant sensation of softness and elasticity, is not damp and moist, indeed, rarely shows moisture upon the surface except on increase of temperature and exertion. AS this is the condition in which it does the best work, it is the condition we wish to obtain in disease. Many act as if they supposed secretion from the skin necessitated the pouring out of an increased quantity of fluids upon the surface, as from the old class of soporifics. Yet in practice we find that the soft and but slightly moist skin is the best evidence of secretion.

The urine, as an index of disease, being fully studied in another chapter of this work, it will only be necessary here to notice a few of the more salient features connected with this study of the secretions.

In acute disease, retention of the elements of the urine is clearly shown by the nervous system that there can hardly be a failure to have our attention directed to them. The first influence is that of excitation; the patient becomes restless and irritable and suffers more than the condition of disease will account for. The second influence is that of oppression; the patient becomes dull and lethargic, an finally sinks into coma. Of course, we may be cerebral excitation and coma without any wrong of the urinary secretion, but we never fail in these cases to make diligent inquiry, and satisfy ourselves as to the source of the nervous lesions.

Now scanty urine has a definite meaning, as has unpleasant sensations in its passage, or a failure to pass it, and in all such cases a critical examination of the urine should be made. In all cases in which disturbances of the nervous system are manifested, such examination is imperatively demanded. This fact cannot be too strongly impressed upon the mind of every physician.

But finding a failure upon the part of the kidneys to do their work, we are not yet ready to say, "Give diuretics." We want to know the condition of the kidneys as regards their circulation and innervation. Such arrest may result from irritation and determination of blood, and any excitant may so increase this as to entirely suppress the secretion and cause death.

Or it may result from capillary congestion, which the ordinary diuretics would increase, and thus death might result from the use of remedies which in ordinary cases would increase secretion.

The condition of the kidneys may be determined in part from a personal examination. In irritation with determination of blood (active condition) the patient will have a sense of constriction in the loins, with tensive or drawing pain, sometimes seeming to be in the spine. Sometimes the sense of irritation extends to the bladder, the urethra, the testes, and even to the rectum. In irritation the patient is restless, quick in his movements, the eyes are bright, the tissues around them seemingly contracted, the tongue small and pointed, and the pulse small, wiry, or vibratile. In congestion the patient complains of a sense of fullness and weight in the loins, and sometimes the same sense of fullness and weight in the pelvis. The patient is dull and apathetic, the eye dull, the face expressionless, the tongue somewhat full, and the pulse lacks sharpness in the wave-oppressed. Such diagnosis is of especial
value, because it enables the practitioner to select his remedies with certainty. If we have the condition of irritation, we give gelsemium, with or without the sedatives, as may be indicated. If there is the condition of congestion, we give belladonna, ergot or solanum, with or withoutaconite as the sedative. Diuretics are not given until there is marked relief and secretion has become more free; indeed, sometimes they will not be required at all. When we do give them, they are selected with reference to the condition of the kidneys-sedative diuretics for the condition of irritation, stimulant diuretics for that of congestion.

Excess in this secretion is not of frequent occurrence, and is usually recognized without trouble. The large amount of urine in diabetes, insipidus and mellitus, attracts the patient's attention, and is evidence to the physician of the nature of the wrong. But there are a few other cases in which the excess is not marked in this way, the patient passing but the usual amount of urine, or possibly it is less in volume than usual. It is only when tested with the urinometer that it is found continuously of high specific gravity, and that the solids are increased from one-tenth to possibly one-fourth more, and still it does not contain sugar or albumin. Such excess will be marked by loss of flesh and strength, and by feelings of weight and dragging in loins or pelvis.

The wrong may be wholly due to a lesion of the kidneys, or principally to an excess in retrograde metamorphosis. This, of course, must be determined to give us a rational treatment. Attention is rarely called to lesions of perversion by the common examinations of the urine. Of course, there are exceptional cases, as the excess of urine in diabetes mellitus, and urinary irritation in some cases of deposit, in which the direct symptoms are sufficient to excite attention. In the majority the diagnosis is made by exclusion. There is an impairment of the health; object-to locate and determine the character of the lesion. And thus we give the patient a thorough examination with reference to the more important functions and organs. Is it of the circulation, digestion, respiration, innervation, nutrition, secretion of skin, bowels, kidney's? Thus excluding one after the other, as we find them free from disease, we at last reach the affected part. Even now we do not know the character of the lesion, and proceed by the same method to determine it. Is there sugar in the urine, albumin, blood, the phosphates, or some of the rarer morbid materials? The general symptoms may point us to the special examination, or we may be obliged to make test after test, until we determine what the real trouble is. But having learned the character of the perversion, we are not yet ready for treatment.

The examination must go a step further-to what extent is it a lesion of the kidneys, or of some other part, the blood, nervous system, or the associate secretions from lungs, skin and bowels?

And still a step further, we want to know the physical condition of the kidneys and the special character of any other wrong. The reader may say these methods are very complex, and it will be difficult for one to follow them out. Possibly this may be true, but there are cases that require just such thorough analysis to give them successful treatment.

When we study excretion from the bowels, we want first to correct our physiological ideas of the value of the secretion, and if we consult an eminent physiologist we find that "The contents of the intestines, even after the use of tolerably simple articles of diet, consists of a mixture of undigested, indigestible, and already changed or decomposed substances, with which are mingled constituents, partly undecomposed, partly already metamorphosed, of the digestive fluids."

But of a real secretion, eliminated by the glandulae of the intestine, the feces contain but a small proportion-probably less than the excretion from the skin.

Excess is usually associated with frequent fluid evacuations-diarrhea-yet we must not take it for granted that in all cases of diarrhea there is excess. Excessive discharges of feces produce debility, first, by the removal of some portions of the food, and, secondly, by withdrawing some of the albuminoid materials of the blood.

Constipation is not to be regarded as positive evidence of defect in secretion from the bowels, as it is possible, and not uncommon, for constipation to exist for days, and excretion goes on into the bowels as before. But constipation may be a cause of disease, either from irritation produced by the debris of digestion, or by the decomposition of some of the material, or by the generation of offensive gases, or the absorption of some of the decomposed matters. Evidences of irritation or of oppression, when they can be referred directly to inaction of the bowels, may be regarded as an indication for the simpler cathartics. The more harsh remedies of this class have usually been used for their derivative effect, and the saline hydragogue cathartics to deplete the blood-vessels of fluid.

Small doses of mild laxatives do increase the secretory function of the intestine, and at the same time improve its function of digestion. The dose is less than that required for catharsis, and the indications are sensations of fullness, weight and atony.

Perversions of the secretions of the bowels and accessory glands are recognized principally by changes in color and in odor, but these are not as certain as would be thought at first sight. The reasons
are clear—there is so much and varied coloring material taken with the ingesta, and the odor, naturally intense and foul, is so readily changed by decomposition of fecal material. Still, it is well to make the feces yield all the information possible.

A few examples may be given in illustration. The vivid green discharges of childhood, acrid and irritating, give information of excess of acid, and suggest the use of alkalies. The extreme yellow (chrome) of infantile discharges evidence an insufficient digestion of the food, both of albuminoid material and fat, and suggest more care in diet, and the use of remedies that give tone to the digestive apparatus. The clay-colored evacuations of disease tell of want of secretion from all the intestinal glands, liver included, of impaired power of digestion, and suggest the use of stimulants to the upper intestinal canal and associate viscera. The yellow rye-mush feces of typhoid fever are characteristic, and call our attention to commencing disease of Peyer's glands.

The deep brown or black feces, with greenish tinge, sometimes yeasty, is one of the most marked indications of the typhoid condition, and calls attention to the necessity of antiseptics. The color and physical properties of mucus, pus and blood, are readily recognized, and either by their quantity, condition, or same local symptoms, their source may be readily detected.

CHAPTER XI.

THE BLOOD AND ITS CIRCULATION IN DIAGNOSIS.

The study of the blood is one of much interest to the physician, for in changes of its structure and circulation we find a principal element in many diseases. The old Hebrew poet well remarked that "the blood is the life of man"; at least we find by experience that wrongs of the blood are manifested by impairment of the life. We study both the lesions of the blood and lesions of its circulation, and it is well to keep them separate in the mind.

Excess in the amount of blood is of very rare occurrence as a cause of disease, and yet occasionally we meet with cases in which, from local disease, the high stimulus of a large amount of rich blood is injurious. We find such cases in local disease of the kidneys, the lungs, the heart, the brain, in which these organs, enfeebled by disease, cannot bear the strain of such vigorous life. This has been named sthenic plethora. There is another condition in which a large amount of blood is continuously made, but, owing to exhaustion of the circulatory apparatus and nervous system by excesses, its circulation is sluggish.

Excess of blood is readily recognized by the fullness of the blood-vessels, especially of the capillary system of the surface, which shows the deep tint of abundant red globules by the full, firm tissues and the vigorous performance of function. Asthenic plethora will be recognized by fullness of blood-vessels, oppression in the stroke of the pulse, and a turgid venous circulation, giving the surface the peculiar color of venous blood. The color is so characteristic that, when associated with the full animalized tissues and the full blood-vessels, there can be no mistake in the diagnosis.

When high stimulus is likely to be a source of danger, we take measures to lessen the quantity of the blood. The safest means is to diminish the supply of food to a minimum, and select such vegetables and fruits as yield small proportions of nitrogenized material. In some cases the saline purgatives and diuretics may be employed to a limited extent with advantage, which, with well-regulated exercise, will remove the source of danger.

Many a man has lost his life because his digestive and blood-making organs were so much better than the remainder of his body that they have furnished the material for a too active life. In asthenic plethora the important remedy is right living. Cut off the supply of stimulant drinks and food, establish good excretion, and have the patient take such exercise as will promote a more rapid combustion and waste of effete material, and in a few months the patient will be on safe ground. Defect in the quantity of the blood—anemia—is readily recognized by the want of color of surface, and the loss of that hardness and elasticity of tissue that we call tone, and a loss of size and functional activity of the soft structures of the body. "As the life of a man is his blood," we have a loss of life in proportion to the condition of anemia.

But we may have gone so far in our diagnosis as to determine absolutely that there is a want of blood, and yet not be ready to make a prescription. We want to know why a sufficient amount of blood is not made, or why, if made, it is not applied to the proper use—nutrition. In one case it will be a want of proper food, or of some special element of the blood, in another a want of buccal, gastric or intestinal digestion, in another a wrong in the blood-making organs, in another a lesion of the circulation, in another a lesion of innervation, in another a lesion of retrograde metamorphosis or excretion. Is it too much to ask that each of these receive due consideration, and that our prescription
should be directed to the special fault? It requires a little time to pass all this in review, but the mind works very rapidly, and, taught to work right, it will do all of this automatically.

Of course, the treatment of anemia must vary in different cases, as the cause of it varies so much. In one case good food, well prepared, is all-sufficient; in another some special element of blood needs to be added; in another the digestive apparatus requires stimulation; in another special stimulants are required to increase sympathetic innervation; in another special means to give a right circulation and temperature; in another stimulants to the formative cells by remedies and exercise; and in others still the cure comes from stimulating the processes of waste and excretion, thus getting rid of old and feeble forms. The consideration of spanemia, or poor blood, is hardly necessary here, because it is included in the general term anemia.

Of course, the treatment of anemia must vary in different cases, as the cause of it varies so much. In one case good food, well prepared, is all-sufficient; in another some special element of blood needs to be added; in another the digestive apparatus requires stimulation; in another special stimulants are required to increase sympathetic innervation; in another special means to give a right circulation and temperature; in another stimulants to the formative cells by remedies and exercise; and in others still the cure comes from stimulating the processes of waste and excretion, thus getting rid of old and feeble forms. The consideration of spanemia, or poor blood, is hardly necessary here, because it is included in the general term anemia.

Whilst it is possible to have a normal amount of blood, yet poor in some of its elements, this is a rather rare condition. It will be known by the full, limp, inactive tissues, the full, blue veins, the full pulse without power in its stroke, and the tendency to dropical effusions. It is really a worse condition than a simple anemia, and requires more care in its treatment. As we employ means to increase the formation of blood, and add those elements necessary to its proper structure, we at the same time wish to get rid of the old stock, and the safest way to do this is by well-regulated exercise and gentle stimulation of the apparatus of excretion.

Special consideration is always given to a want of some of the elements of blood, and to the means which will restore them. This is the basis of the treatment called restorative. If the blood requires phosphorus, it will not do to give it iron, as when it requires iron it will not do to give it sulphur or a bitter. The special symptoms heretofore named, showing these defects, should be closely studied.

But the blood may be bad, or changes may be going on which will work its destruction.

This fact can be recognized in the ordinary way, by an inspection of it where it shows at the surface, by any material (secretion) that is drawn from it, and by wrongs in the nutritive function which is based upon it. When you think of these methods for a moment you will see that they have a physiological basis, are plain, and eminently practical.

In acute disease we are more interested in those changes going on; in the blood which we call septic, than in any special material contained within it, and these changes are more readily recognized by exudations than other means. Attention has already been called to the secretions and deposits upon the tongue, as evidencing the condition of the blood.

We find that all exudations that might be called dirty, and all changes in color toward brown and black, might be regarded as certain evidence of sepsis, and of the impairment of the blood. In so far as the term typhoid is applicable to sepsis, these symptoms are among the most prominent in typhoid diseases.

Any exudation will serve to show the character of the blood as well as the coating upon the tongue. The discharges from the bowels and of urine, the spuita in disease of the respiratory apparatus, the lochia in puerperal disease, the "washings-of-meat" discharges in dysentery, the secretions of an ulcer, the sanies of an injury or surgical operation, all tell the story explicitly. It is not possible to get a good secretion or exudation from septic blood, and the character of the one will show the condition of the other. In some forms of chronic disease there is effete or imperfectly elaborated albuminoid material in the blood in considerable quantity. It serves to lower the character of this fluid, and to impair all vital activities, and, by influencing the nutrition of structures, it gives rise to local disease.

The evidence of bad blood is best found in wrongs of excretion and of nutrition. There cannot be a wrong of this character without an effort on the part of the skin, kidneys and bowels to remove the unpleasant material, and we will usually find that all three of these emunctories show a lesion caused by the effort, though one may suffer more than another. In the case of the skin it manifests itself in cutaneous disease, taking the forms of the exanthemata in the simpler cases, and the graver forms of the pustuae, squamae and tuberculae, when the lesion is more persistent and severe. This fact has long been recognized, in so far as the treatment of skin diseases has embraced means for removing effete and unpleasant materials from the blood. In a large number of cases, a treatment that looks to the increase of excretion, and better digestion and blood-making, removes all the unpleasantness. In the remaining cases some special material of the blood is wanting, frequently lime, sometimes sodium, potassium, phosphorus, etc.

In some cases the urinary apparatus is the special seat of suffering. The entire apparatus is irritable, and the urine contains an abundance of ammoniacal compounds, and gives characteristic deposits. The effort at removal may be continued by these organs until severe disease is induced, as seen in some cases of chronic inflammation and an occasional case of degeneration. The bowels always suffer more or less. Indeed, it is hardly possible that this condition should continue long
without a loss of regularity in defecation and a change in the character of stools.

The lesions of nutrition may take the form of degeneration or of deposits. In the one case we have the symptoms of enfeebled function, and a want of expression in the soft tissues.

In the other comes the evidence of local disease, enlargement preceding inflammatory action, which runs a very irregular course. Whenever swelling and change in the form and functions of apart precede inflammatory action, there is a wrong of the blood, and means must be employed to remove the unpleasant material by excretion, and to provide for better blood-making.

The process of cure here is clearly indicated. The bad material is to be removed, and good material is to be introduced in its place. We wish to know whether it is necessary to employ means to stimulate retrograde metamorphosis, by exercise or medicines, to increase the processes of combustion, to employ remedies that modify and arrest the septic processes, or to use such as increase excretion. It is possible that the habits and surroundings of the patient must be changed before a cure is effected, or that he should have better food, better digestion, or better blood-making. In thus getting a better blood, there is less tendency to depravation.

Among the most common lesions in disease are wrongs of the circulation of the blood. We may state it as an axiom that the condition of health requires a circulation normal in time and character, and just in proportion as we have a change from this normal standard we have severity of disease.

The time of the pulse varies greatly in different individuals in a state of health, in the adult having a range of from sixty to eighty beats per minute, yet in its other characteristics it is pretty uniform, and can hardly be mistaken. The finger on the pulse is trained to determine lesions of the circulation, and should rarely make any mistake.

The wrongs of the circulation may be general or local, and classified under the three heads, excess, defect and perversion. The first has reference to rapidity, the second to impairment or checking of the circulation, and the third may embrace cases in which the circulation is not uniform, or is irregular.

Increased frequency of pulse is one of the characteristic symptoms of fever, and is usually associated with a proportionate increase of temperature. As a rule, we estimate that ten pulsations represent one degree of temperature; that is, that for each degree of increased temperature we may expect to find an increase of ten pulsations per minute. There are many exceptions to this rule, the increased frequency of pulse being sometimes more, sometimes less, and indeed sometimes showing but little relation. As a rule, increased frequency of pulse represents gravity of disease, and we are accustomed to think of it as an unpleasant symptom. As is the frequency of the pulse, so is the arrest of secretion, the increase of heat, the impairment of digestion and blood-making, the arrest of nutrition, the development and progress of sepsis, the progress of inflammatory disease, and the danger to life, local and general. Hence the importance of means which influence the circulation, reducing its frequency without impairing its freedom.

Frequency of pulse may be the basis of fever or inflammation, and when the pulse is brought down to a normal standard all the other phenomena of disease may disappear. Thus we often observe, under the influence of special sedatives, that as the frequency of the pulse is reduced the temperature falls, the nervous system is relieved, the skin softens and becomes moist, the urine is increased, the bowels move of themselves, and the appetite returns. Or, in case of inflammation, the pain ceases, there is less heat, redness and swelling, and resolution rapidly progresses to complete restoration. These results are so common that we are surprised in some seasons and in some cases to find that the sedatives do not seem to produce sedation.

This brings up the important point in the study of disease, that there is a first and predominant wrong upon which the entire morbid process rests. In some cases, as in the instances given, this is so markedly the case that when we have removed this the whole disease rapidly fades away. But in others this simply paves the way for the doing of something else, and this again for the restoration of other functions, and thus a succession of means may be required in a single case.

It will not do to say here, "I have frequency of pulse, and my patient requires a sedative," taking anyone of this class at random. The ten or a dozen remedies grouped under this head are not alike, and cannot be used one for the other. It is true that we may so substitute veratrum and aconite in many cases, but even these had better be given according to the special indications-veratrum when the pulse is full, aconite when it is small.

Then we have ferrum phosphoricum when the pulse is neither full nor small-a medium pulse-digitalis when the pulse is feeble, lobelia when it is oppressed and the artery is turgid with blood, gelsemium when it is full and vibratile, belladonna when it is full, soft, and without strength, etc. Slowness of pulse is not a common symptom in disease, but is occasionally met with in chronic
disease. It indicates a want of innervation, or excitability of parts supplied from the sympathetic. The wrong may be found in degeneration of tissue, or simply a want of waste and nutrition, the tissues becoming old and inactive. In some cases the pulse will be slow when the patient has remained quiet for some time, but is increased in frequency upon exertion.

These cases will be benefited by the use of small doses of crataegus, lobelia, digitalis or ergot, with the use of means to stimulate increased waste and nutrition. Changes in the character of the pulse are of very frequent occurrence.

In most severe diseases change in the character of the pulse will be found associated with frequency, and will probably point out the sedative which will be found most useful. Our examination of the pulse has reference to size, the movement of the mass of the blood, the impulse of the wave, its length, general character and termination, and the inter-wave current. A reference to any sphygmographic illustrations will show that there is very great variation in all of these, and that they do represent definite pathological conditions.

Irregular distribution of blood is frequently met with in disease, and a popular expression in treatment is, "equalize the circulation." There is no plainer pathological fact than that the circulation of blood is unequal in many instances—here too much blood, there too little—a want of circulation to the extremities and surface, too much blood in the cavities of the body. That such inequality is the cause of disease is very easily shown by many examples. Everyone will recollect the cold feet and chilled surface that attends an ordinary bad cold, and will recall the local and general wrong that comes from a similar condition at the period of the menstrual flow, very greatly increased by the local stasis of blood in the uterus if the flow should be stopped. Many can recall cases of chronic disease, associated with cold feet and a tendency to chilliness of the surface from imperfect circulation, and they will recollect that such cases were very intractable. Some will recall cases of pneumonia or of typhoid fever, in which an irregularity of the circulation, and a tendency to accumulation of blood in the cavities, and a want of blood to extremities and surface, were prominent features, and they will recall the gravity of such cases.

As the mind recalls these well-known facts, the importance of equalizing the circulation will be seen. If in the commencement of a cold, means are employed to give an equally vigorous circulation to surface and extremities, the mucous membranes cease to suffer. If in chronic disease we so improve the circulation that all parts receive an equal quantity of blood, we have accomplished one of the essential things necessary to recovery. If in severe local disease, or the graver acute affections called typhoid, we find an irregular distribution of blood and heat, getting well will probably depend upon our ability to rectify this wrong.

The local lesions of the circulation that interest us most are embraced under the head of hyperemia, or an excess of blood in a part. This has special reference to the capillary circulation, though arteries and veins are involved to a limited extent. The condition of local hyperemia is easily understood and recognized. In health the mass of capillaries are not full; indeed, it is impossible that they should be full at once. If there is an increased amount of blood in a part, with its motion unchanged, there will be increase of size—swelling—redness, if the part is superficial, and increase of temperature and sensitiveness.

Whilst it is possible to have the condition above named, it is uncommon. As a rule, there is a change in the rapidity of the circulation as well. Thus we divide hyperemia into two varieties, active and passive. In the one there is excess of blood in a part, with its movement increased, and in the other excess of blood in a part with its movement diminished. We call the first determination of blood, and the second congestion. It will not do to mistake these pathological conditions, as the treatment of one is almost the opposite of that of the other.

The cause of determination of the blood is one—irritation; and the condition of the part is one of excitation. The symptoms are very clear—there is swelling, heat, increased sensitiveness, and redness. In minor degrees the functional activity of organs and parts is increased; but when in excess, though the part is excited, the function is diminished.

If we now compare with this the condition of the capillary circulation in congestion, we will see that there is much difference. In this the capillaries are filled with blood, but the movement of the blood is sluggish, or entirely arrested in some vessels. The active life of the part is impaired to the extent of the impairment in the circulation, and all the expressions show dullness and want of functional activity.

Whilst there was but one cause for determination of blood in congestion we may have three.
The principal one of these is an impairment of the life of the part-the structures being enfeebled, the capillaries yield to the force applied from behind the blood. In some cases an irritation of the part is a first cause, determining a greater amount of blood to it than its weakened vessels can withstand. In other cases an obstruction to the return current by way of the veins is a principal cause.

The symptoms are all of impaired function and oppression, and when we compare this with the excitation of the active state of determination of blood, the distinction will be clear. We say that the sensations are of fullness, weight, dullness, and if there is pain it will partake of these characters. The objective symptoms when near the surface are of swelling, and an increased redness that has not the brightness of the active circulation; the temperature mayor not be increased.

If we take some examples of the two conditions, the subject may be clearer. In determination to the brain, there is a flushed face (bright), bright eyes, contracted pupils, increased temperature and excitation of function-the patient being excited, restless and sleepless. In congestion the face is, usually flushed (dusky, purplish or livid), the eyes are dull, pupils dilated or immobile, the mind is sluggish and the patient inclined to coma.

If we take the lungs, we find in determination a rapid, uneasy respiration, characterized by quick movements of the walls of the chest, and the patient shows the excitation in the sharp, forcible cough, and frequent change in position to get relief. The functional activity of the lungs being increased, the color of the blood when it reaches the surface is brighter than usual, and the surface is therefore flushed. In congestion the movement of the chest is sluggish, labored and oppressed, and the cough has a like dull and oppressed character. The function of the lungs being diminished, the surface is inclined to be dull, dusky or livid. If we take a diarrhea as an example, the symptoms are quite as clear. With determination of blood there is marked uneasiness, and the evacuations are unpleasant or possibly painful and attended with some tenesmus. From congestion the bowels are tumid, have a sensation of weight and fullness, and the discharges are free and without uneasiness.

Whenever we find the two conditions, the symptoms will have the same character, and will be shown by the sensations and by the function of the part. In determination there is a feeling of increased activity, and in congestion the feeling of impaired activity; in determination there is excited function; in congestion impairment of function.

As the cause of determination is irritation of the part, any agent which will remove this irritation becomes a remedy. As the circulation in its entirety is controlled by a system of nerves, a lesion of a part may sometimes be best relieved by an action upon the whole through the sympathetic. Determination of blood to any part may be relieved by the use of veratrum, aconite and gelsemium. Other than these general remedies, we select those that influence the special part affected, and remove irritation. In determination to the brain we use gelsemium; to the lungs, veratrum, bryonia or ipecac; to the kidneys gelsemium; to the bladder eryngium; to the bowels ferrum phosphoricum, aconite and ipecac; to the uterus aconite and macrotys. In so far as we use local applications, they are selected in the same way: wet packs, poultices, fomentations, enemata, inhalations, etc., are selected with reference to their sedative character.

In congestion the part requires stimulation, especially stimulation through the sympathetic. It may also be influenced to a greater or less extent by remedies stimulating the circulation at large. Thus, belladonna, crataegus, ferrum phos., and, to some extent, aconite, are of value in all cases of congestion. Other remedies are selected with reference to their action upon the part, as stimulants or excitants.

In congestion of the brain, we use belladonna; in congestion of the lungs or of the heart, Crataegus or lobelia; in congestion of the abdominal viscera, nux vomica; in congestion of the kidneys, belladonna, etc. In selecting local applications we observe the same rule; whatever their form, they should be excitant to the part. In studying the action of remedies, we first wish to know where they act, and, second, the kind of action.

If a part is diseased, we wish a remedy that acts upon that part particularly, and which does that which is necessary to restore it to health.

In the case of determination of blood-the active circulation-we want a remedy that will remove irritation and the undue excitation of its circulation; in congestion we want a remedy that will increase the life of a part, or that will give the necessary stimulus to the capillary vessels.

According to Dr. Williams, inflammation is a local hyperemia, with the movement of the blood partly increased and partly diminished. We study this process of disease with reference to its cause, the lesion of the circulation, the exudation, and the result or termination. The cause is one, irritation with such impairment of vegetative life. From the irritation comes an increased circulation to the part; the capillaries are filled with blood, which in some moves slower and slower, until the circulation through them is arrested; and yet in others the movement of the blood still continues rapid. As the capillaries
The departure from the normal standard the greater the danger to the tissues. Suppuration is announced as the result, as well as when we have marked swelling and redness with impaired sensibility and arrest of function. The sensation given to the touch will be most reliable in external inflammations; the greater the impairment of life as a whole. In this respect it may be said that those cases of but moderate excitement are really impaired.

Recognizing the presence of an inflammation, we want to know the danger to the life of the part, and to the life as a whole. In this case the symptoms of the first and second stages are almost opposite active delirium and coma. In inflammation of the lungs we find at first increased activity and a rapid oxidation of the blood; but in the second stage there is oppression and an imperfect aeration of the blood. In inflammation of the liver there may be at first stage an increase of biliary secretion, whilst in the second there is complete arrest.

The symptoms of inflammation, according to the old authorities, are pain, heat, swelling and redness, and for superficial parts these are characteristic and definite, but for internal and concealed parts we are obliged to rely upon the first, and the evidences of impaired function, and the influence upon the general health.

Pain is a very constant expression of inflammation, though it is very common from other causes. It varies from simple uneasiness from over-excitation, to the sharpest and most severe suffering, and its intensity is not to be taken as the measure of inflammatory action in any case. It becomes symptomatic of inflammation only when there is evidence of a wrong circulation, and increase of temperature, general or local.

Heat is a constant symptom, and much more reliable than pain. It may be but local in superficial inflammation, or when but a small and unimportant part is affected, but is general when an important part or much tissue is involved. In some cases the patient's sense of heat may be taken as evidence, though this is very liable to error. As a rule, the temperature of an inflamed part will not rise higher than 102°, unless there is a corresponding elevation in the temperature of the body, and there is rarely more than one or two degrees difference between the general and local temperature. The sense of heat, when the hand is placed upon a superficial inflammation, is due in part to arrest of secretion from the skin, which is also the cause of any difference there may be in temperature.

Swelling is also a constant symptom, though not so marked when free surfaces are involved, or very dense tissues. It is not a reliable symptom, however, for it may be due to changes in the nutrition of a part, to growths, deposits and exudations. To be of any importance in diagnosis it must be associated with evidences of derangement of the circulation, and with increased heat.

Redness is only an evidence in superficial inflammation, and is due to the presence of a large number of red globules. It is deeper than in determination of blood, though it may be simulated by some rare conditions of the skin. Among the prominent and most valuable symptoms of inflammation are wrongs of function; these are constant and characteristic. In the early stage of excitement the functional activity of some parts will be increased; but in a majority it simply shows excitement and is really impaired.

As the capillary stasis increases, and exudation occurs, the function becomes more and more impaired, until in some cases it is completely arrested. Thus, in inflammation of the brain we have at first great mental excitement, then delirium, then probably incoherent (muttering) delirium, and finally, from exudation, coma. In this case the symptoms of the first and second stages are almost opposite active delirium and coma. In inflammation of the lungs we find at first increased activity and a rapid oxidation of the blood; but in the second stage there is oppression and an imperfect aeration of the blood. In inflammation of the liver there may be at first stage an increase of biliary secretion, whilst in the second there is complete arrest. So in inflammation of the kidneys, the first excitement produces increased secretion of urine, whilst the second may arrest it entirely.

The different phases of the inflammatory process and its results require care in diagnosis. Recognizing the presence of an inflammation, we want to know the danger to the life of the part, and to the life as a whole. In this respect it may be said that those cases of but moderate excitement are most favorable.

When the vascular and nervous excitement are extreme, we may anticipate an unfavorable result, as well as when we have marked swelling and redness with impaired sensibility and arrest of function. The sensation given to the touch will be most reliable in external inflammations; the greater the departure from the normal standard the greater the danger to the tissues. Suppuration is announced when...
by an increased fullness of the tissues, a sense of increased tension, and a change in the character of the
pain, which becomes throbbing. If but a moderate amount of tissue is involved in an unimportant part,
suppuration is followed by relief of the general symptoms, but when considerable tissue is broken
down, or important organs are involved, it is frequently ushered in with a chill, and attended by a fever
having somewhat the character of hectic.

Gangrene of external parts is announced by the change in color-purplish or black-by coldness,
and a want of sensibility. Internally it is announced by great prostration, the subsidence of pain, loss of
sensibility, and a soft, feeble pulse. The general symptoms are those of fever. The cause of
inflammation is depressing to the life of the individual as well as to the life of the part, and when
considerable structures are involved the expressions are very distinct. The first influence gives the
listlessness, languor and loss of function; this culminates in a chill or rigor; and this is followed by the
symptoms of febrile reaction-frequent pulse, increased temperature, arrest of secretion, and
derangement of the nervous system.

In the severer cases of inflammation these general symptoms are as pronounced as in fever, and
it is sometimes difficult to determine a local lesion, except by close examination and attention to
special symptoms. If care is used, however, a special wrong of function will attract attention to a part
or organ, and symptoms of inflammation will be detected.

The close relationship between fever and inflammation should not be forgotten, and indeed it is
well in practice to recognize them as requiring the same treatment; an inflammation is fever of a part.
The remedies for fever are remedies for inflammation, and in many cases they are the best and most
direct we have. If, in the majority of cases, the pulse is brought down to a normal standard, the
temperature reduced, innervation normal, and the secretions restored, the inflammatory process will
cease, and, if the life of the part has not been too much impaired, resolution will be rapidly effected.

In studying the treatment of inflammation, it is well to bear in mind the different phases of the
morbid process.

First, irritation and determination of blood; second, impairment of capillary circulation until its
final arrest, and lastly, the impairment of the life of the tissues from this and the exudation. The
irritation may continue through the entire progress of the inflammation, and thus will continually
attract the blood to the part, whilst from the commencement there are marked evidences of impairment
tissue life.

Anything that will lessen or remove irritation will prove a remedy in inflammation. Take away
the irritation, and you take away the cause of an excited circulation of blood to and in a part. The
general means have been already referred to, but some of them are local as well.

The sedatives, veratrum, ferrum phos. and aconite, influence the inflammatory process directly,
wherever it may be located. In the selection of local means we must closely observe the inflammatory
process, and determine the kind of influence most desirable. In some cases it may be directly sedative,
removing irritation; and in others, while we endeavor to remove irritation, we also keep in view the
necessity of stimulation to the capillary circulation. The principal object, however, must be to employ
such treatment as will increase the life of the tissues.

When we have determined by an examination that the inflammation must terminate in
suppuration, we should not forget that resolution goes on at the same time, and that it is our business to
confine the suppurative process to as small a proportion as possible, and to obtain resolution as far as
practicable. The treatment is just the same as in mortification; we wish to restrict the death to as small
a portion as possible, and we do it by strengthening the life of the tissues.

The means named are those which might be embraced under the head of physiological
medicine, and give us an excellent basis of treatment in many cases. In some we have special means,
the action of which cannot be explained in this way. These remedies are indicated by some special
expression of disease, and they prove curative in seemingly very diverse conditions of disease. As an
illustration we need here but instance the action of tincture of muriate of iron in erysipelas; the action
of bryonia, cimicifuga and rhus, and some other agents, in the arrest of special inflammations, or the
special action of drugs on individual parts or associate functions, as phytolacca in mammary
inflammation, or in disease arising from nursing.

CHAPTER XII.INNERVATION IN DIAGNOSIS.

We divide the nervous system into three parts for studythe brain, the spinal cord, and
sympathetic. The first is the organ of conscious life, the second of automatic move-ment, and the third
governs and associates the functions of vegetative life. The functions of the brain are reason, emotion,
volition and sensation; of the spinal cord, the co-ordination of muscular action, and the functions of
respiration, defecation, and urination, and expulsion of the uterine contents; and of the sympathetic, digestion, circulation, nutrition, and secretion and excretion.

Lesions of innervation may be due to a change in the condition or structure of the nerve centers, or to some lesion external to these. The more common lesions are of the circulation, and we have them from the two opposite conditions of an excited circulation-too much blood in a part; or an enfeebled circulation- too little blood in a part. Whenever we find these lesions, this is the first question we ask, and usually the symptoms of hyperemia or anemia will be distinctly marked. A physiological treatment will be based upon this, to a considerable extent. If we have hyperemia, we use remedies which lessen excitation; if it is anemia, we employ such agents as stimulate and give a more vigorous circulation. In the first cases the treatment may be temporarily depressant, in the second it is always restorative and tonic.

Delirium in acute disease is readily recognized. The inability to reason rightly, and the illogical and unreasonable expressions tell the story clearly.

We say delirium is active, it is passive, it is coherent, it is incoherent-taking the entire range of that active continued expression, in which it is almost impossible to control the patient, to the dreamy delirium of typhoid fever, in which the patient is calm and still, or the muttering delirium that soon passes into coma.

But we are not so much interested in the expression of delirium as we are in the symptoms indicating the physical condition of the brain. We want to know whether there is an active circulation, or an enfeebled one; whether the patient can bear temporary depressants, or requires stimulants and restoratives. The practitioner will recognize the pertinence of this inquiry, as it points the way to the selection of direct remedies. In the first case we use the sedatives and associate means that relieve excitement, and the special remedy, gelsemium, In the second we use quinine, stimulants, restoratives, tonics and food.

It may be remarked here, that in addition to the means selected in this way, any remedy which may be indicated by special symptoms, is a remedy for delirium.

Thus we see a delirium rapidly disappear under the use of an acid, an alkali, one of the antiseptics, rhus, and other agents. The two methods may be sometimes combined; though, if the symptoms indicating a single remedy are pronounced it should be first given.

In delirium tremens we also find two conditions of the brain as a basis for the wrong reason. Delirium tremens often arises from two opposite conditions of the brain-one in which the circulation of the organ is depressed, and the other in which it is too active.

If we find our patient with sunken eyes, blanched or livid lips, cold extremities, and a small and feeble pulse, we know that he requires stimulants, and especially food. In the early stage of such a case we would expect to arrest its progress by the stimulant action of capsicum, strychnia, acetate of ammonia, nux vomica, hot broths and hot baths. If the stomach cannot retain food, enemas of hot beef-tea will act beneficially.

But if we find him with a florid face, full, bright eyes, increased temperature, and a full, hard pulse, we recognize a condition of undue excitement, and would hardly use the treatment just named, though it has proven successful in cases of delirium tremens. On the contrary, we propose to select remedies which will remove the undue excitement of the circulation and give rest to the brain. Thus we give full doses of veratrum and gelsemium, saline cathartics and diaphoretics, and possibly follow with bromide of potassium, chloral and morphine.

If we study puerperal mania, or acute insanity, we find two classes of cases, as in delirium tremens. In one, from excessive discharges and lactation, we have a condition of anemia. We find the face pallid, the eyes dull, the tongue broad and pallid, the pulse small and feeble, and the extremities cold. We at once recognize that this patient wants proper stimulants, tonics, restoratives, and food, and as we give them we find that there is a steady improvement.

But in other cases we find a flushed face, full, bright eyes, contracted tongue, increased temperature, a full, hard pulse, and partial arrest of secretion. The case is just as clear as the first one, and we cure it by the use of the proper sedative, gelsemium and means which will restore secretion and excretion. In this case temporary depressants may sometimes be employed with good results.

In chronic mania, the diagnosis of the physical conditions of brain and body will be made in the usual way. All wrongs of function and structure are to be removed as far as possible, and the patient placed in the best possible health. Thus, if there are any special indications for any single remedy, this should be given. In some cases the action of such agents is very speedy and permanent.

With regard to the psychological treatment, but little need be said. It must be based upon this law of nature, "that in proportion as an organ or function is used it gains strength, and as it is disused it loses strength." In so far as the morbid mind has material to feed upon, and has exercise, the insanity
will be increased; and in so far as the normal functions of the mind are disused they become enfeebled.

The object, therefore, is to call out the mind in orderly channels as much as possible, and to give as little cause for the insane manifestations as possible, that the one may gain strength and the other lose it.

What has been said with reference to reason is applicable to the emotions, in so far as the necessity of recognizing the physical lesions are concerned. Emotional wrongs have a physical basis, and if perfect health can be restored they will pass away. Indeed, permanent cures can only be effected in this way.

The wrongs of the emotions may be in either of the three ways—excess, defect, and perversion—but the first and last associated are usually met with. The expression is so distinct that it can hardly be mistaken; too great a manifestation and rapid alternation of grief, joy, hope, fear, exaltation, depression, etc., without sufficient or corresponding cause, tells the story. Hysteria is the type of this class of diseases, though it involves other than the emotions. A defect in volition is often noticed as an element of mental disease, and as an attendant upon some other diseases. It is often remarked that the strong will is an important means of recovery—"that when one wills to get well, he will get well—and every practitioner will have noticed the difficulty of managing those cases in which there was an indifference, or want of volition. The expression of the face will frequently give this information before a word is spoken.

The firm expression of the muscles of the mouth and closure of the jaws, is characteristic of strong will; whilst the relaxed muscles of the mouth, and the general want of expression, tells of enfeebled will.

In many cases recovery will largely depend upon strengthening the will. If we can call it into action by presenting additional motives for its exercise, or by a judicious stimulation from attendants and friends, we will find that it will grow by exercise, and that which was difficult to the patient at first soon becomes easy and natural.

The brain receives impressions from the world without, and from the various parts of the body, through the apparatus and nerves of special and general sense—and this we call sensation. In the healthy body all sensations from it are pleasurable, and the use of the special senses is a source of pleasure. But in disease sensation is unpleasant, and a source of discomfort, and we designate it as pain. It is well to become thoroughly conscious of this, by passing the various sensations in review.

To the sound eye use is a pleasure, and we only know the organ through the pleasurable sense of vision; the impulse of sound waves upon the ear is pleasurable, and so are senses of taste and smell. Then this sense of pleasure is lost, we may know that an organ or part is diseased, though the discomfort may not tell us the quality or amount of disease. If the use of the eye becomes a source of discomfort, our attention is called to that organ as the seat of disease, and we at once make a proper examination to determine its character. If the use of the ear is a source of discomfort, we at once conclude that it is the seat of disease, and we make the necessary examinations to determine its exact character. If there be discomfort in the sense of taste, we know there is a wrong in the mouth where these nerves are distributed, or of the digestive apparatus to which these nerves stand sentinel. If there be discomfort in the sense of smell, we at once conclude there is disease of the nasal cavities. So when there is discomfort from any apparatus or function, we proceed with the proper examinations to determine its character.

Persons will sometimes have their first knowledge of organs or functions through discomfort and pain. The dyspeptic realizes that he has a stomach through pain; the minister realizes that he has a larynx, when it has become irritable and painful by abuse; the location of lungs, liver, spleen, bowels, kidneys, bladder, uterus, etc., is first realized by many through the suffering of disease.

It is well to bear in mind that pain may have two causes—it may be due, in principal part or in whole, from disease of the part that suffers, or of the brain that receives the impression. To determine this is an important part of the diagnosis of pain. A little care in noting the expression of the face, the eyes, and the other functions of the brain, will determine this in most cases, and this may be supplemented by a careful examination of the part.

The diagnosis between the pain of structural disease and neuralgia is usually made with ease. The absence of heat, redness and swelling, in any considerable degree, is usually sufficient, but in obscure cases it is well to carry the examination further to determine lesions of the blood, of nutrition, waste and excretion.

General disease will give rise to the conditions of pain, and to a considerable extent may be considered its cause. Thus, the vascular excitement and increased temperature of fever render the brain more sensitive to impressions, and the nerves more active purveyors. The symptomatic fever that attends inflammation has the same influence in increasing pain. Thus, in those cases where pain is very
severe, the means that lessen the frequency of the pulse, diminish the temperature, and establish secretion, are the most effective to cure pain.

When we study the condition of the brain as a cause of pain, we find that it is not one, as generally supposed, but two, possibly three. In one case we have evidence of vascular excitement in the flushed face, bright eyes, contracted pupils, and increased temperature. And we meet this condition with gelserium, the sedatives, and possibly the saline diuretics and cathartics. In the second case we find the evidence of an enfeebled circulation in the pallid, expressionless lips, the dull eyes, dilated or immobile pupils, and possibly the coolness of nose, ears and forehead-the general expression is of want of stimulus. In these cases we think of nerve stimulants, of belladonna, quinine, nux, ammonia, etc.

The feeling of dullness and inclination to sleep attending some forms of pain is met especially by belladonna and ergot. The wrongs of perversion are not so easily determined, but with care we may find the indications for special remedies, sometimes in the expression of the face, sometimes in the appearance of the tongue, and sometimes in the changes of the pulse.

There is no doubt that many times the character of the pain may point out the special remedy for the cure of the disease, though it is not as certain as other means of diagnosis. If we could feel the pain, as we feel the pulse, it would be different, but trusting to the patient's uneducated senses, and his imperfect power of analysis and expression, we find it uncertain.

Lesions of spinal innervation are diagnosed from wrongs of function controlled by this nerve-center. Thus, impairment of muscular motion may be referred to an enfeebled spinal cord, an exalted sensibility of muscles, to increased spinal innervation, whilst all forms of convulsion may be attributed to perverted spinal innervation. Among the important functions controlled from the spinal cord is that of respiration. We will sometimes find deficient respiration, that physical examination will determine is not from structural disease, and we reach the conclusion that it is want of innervation. In acute disease we sometimes find this so marked that respiration cannot be carried on except through the influence of the will and the external respiratory muscles. We notice that, so soon as the patient sleeps, respiration becomes more and more difficult, until at last he is suddenly aroused by a feeling of asphyxia; thus rest is prevented, and death may result. In all of these cases we think of spinal stimulants as remedies, nux vomica and strychnine being the type; and, increasing spinal innervation, we find our patient breathes easier, and gets necessary rest.

The lesions of excess are rather rare, but still they deserve close study. We find it marked in some cases by excessive muscular irritability, so that the patient exhausts himself by over-exertion, or more frequently by that uneasiness which might be called muscular fret. In others the lesion is principally manifested in the respiratory muscular apparatus, giving frequent or irregular respiratory movements-respiratory fret—or sometimes severe and intractable cough from very slight internal irritation.

In other cases we find the evidence in defecation and urination, giving frequency and some tenesmus, without corresponding internal disease. In these cases there is usually hyperemia of the cord, marked by a full, hard pulse, tense skin and muscular structures, and rigidity or contraction in all the expressions of the body. The remedies will be veratrum, gelsemium, the saline cathartics and diuretics, alkaline bath, etc. In some rare cases there is a condition of anemia, and the patient requires nux, strychnine, quinine, iron, arsenic and stimulant baths, with restoratives and animal foods. The lesion of perversion gives us the entire series of convulsive affections, so frequently met with in the practice of medicine. In this case the spinal cord takes complete control of the body, and sets it into disorderly movement. How the wrong is produced, or what is its exact character, is not known, but when once it has obtained, the tendency is to its repetition. There is no difficulty in its recognition; the complete arrest of the function of the brain, and the disorderly activity of the muscles, are so marked that it cannot be mistaken.

Two causes of convulsions are recognized; the one disease of the spinal cord itself-intrinsic, the other a lesion of some other part-extrinsic. The exact conditions of the spinal cord are not well known, but we may recognize one of vascular excitement and one of atony and impaired circulation. In the first the surface and face are flushed, the eyes bright and pupils contracted, the pulse somewhat full and hard, and the temperature usually increased. In the other the face is pallid or livid, the eyes dull, the pupils dilated in the intervals of spasm, the extremities cold, and the pulse small and frequent. There is a third case in which there is very evident congestion of the cord, and the face will be full and dusky, the eyes protruding, and the pulse full and oppressed.

These cases are usually so well marked that the diagnosis is not difficult, and a correct treatment is at once suggested. In the first case we use gelsemium, passiflora, or veratrum. In the second case we use lobelia, chloroform or bromide of ammonium; in the third case, belladonna, ergot,
and possibly aconite. Bromide of ammonium is sometimes an excellent remedy here. It is most absurd
to think of treating all cases of convulsions with one prescription.

Specific Medication never goes that far; it treats conditions of disease, and not diseases as
classified. The instance of convulsions furnishes a very good example of the necessity of accurate
diagnosis.

It is well to note here that the spinal cord having formed a habit of convulsive action, has a
tendency to repeat this at varying intervals, even though no change of structure, or disease of other
parts, can be found to account for it. In addition to the treatment for the convulsions, this habit or
tendency to recurrence is to be broken up, and we find in many cases that the longer the convulsive
action can be postponed the less disposition there is to its recurrence. In the treatment of some cases of
epilepsy this is a principal object, and any means which will even temporarily ward off an attack
becomes a part of the cure. The extrinsic causes deserve consideration, though many times they have
ceased before we are called to treat the cases. If in infancy we find the gums swollen and purplish, a
free incision over the coming tooth may relieve the convulsion at once. If green fruit or other irritant
ingesta has proven a cause of convulsions through irritation of the stomach, an emetic will give the
speediest relief. If it has come through irritation of the solar plexus, attended by pain-colic-nux vomica
will give relief. If from irritating materials in the intestine, cathartic enemata may be of great service. If
from partial suppression of urine, the hot packs over the loins, with gelsemium or apis, will be the
treatment.

Worms may be a cause of convulsions, and yet it is not advisable to give the usual remedies for
worms until all symptoms of nervous irritation and convulsions have been removed. Otherwise the
additional irritation from the worm medicine may prove fatal. In epilepsy the original cause may pass
away in a few hours, or it may persist for years. Thus in some cases an epilepsy will arise from a
temporary irritation of the stomach, the intestinal canal, or the reproductive apparatus, and no traces of
the lesion will be found when we are called to treat the patient. But in other cases the lesions will
persist, and their occasional or periodical increase will determine the convulsion. Thus, menstrual
derangement may prove a continuous cause, as will disease of kidneys, stomach, bowels, and some
other parts. In all cases the examination is carefully made to detect local lesions, and, when found,
means are employed to remove them, as part of the cure.

The study of paralysis might follow the consideration of the lesions of the brain and spinal
cord, as it may embrace either or both. When the lesion is one of the hemi-spheres of the brain, the
paralysis is of one-half of the body, divided vertically, and is called hemiplegia. Then it is of the spinal
cord, it is of the lower portion of the body, the division being horizontal, and involves all parts below
the seat of disease; this is called paraplegia. When of but limited extent, we call it local paralysis, and
we trace it to a lesion in the course of the nerves, or to a limited disease of the center from which the
nerve has its origin. We must not suppose that when we have diagnosed a paralysis by the impairment
or total loss of motion or sensation, or both, that we are ready to make a prescription, and that all that is
necessary to be done is to stimulate the nerve centers or the affected parts, by strychnia or electricity.
We want to know the character of the wrong, both of the nerve centers and of the general health, and
when we have determined this we can prescribe intelligently.

In hemiplegia we find two conditions of the brain. In one case we will have a flushed face,
bright eyes, contracted pupils, increased temperature, impaired excretion, and a pulse characterized by
fullness and hardness. Surely no sane person would treat this case with nux or strychnine. On the
contrary, we use the proper sedative, gelsemium, means to establish secretion, and possibly
suppurative counterirritation. In a second case the face is swollen and dusky, the lips livid or purple,
the eye dull, pupils dilated or immobile, and the pulse full and oppressed. This patient wants
belladonna, ergot, bromide of ammonium, and, possibly, stimulating cathartics. In a third case the head
is cool, the face lacks expression, and the pulse is nearly normal, but wants force. Every symptom
points to anemia of the brain, and to the want of restoratives. Here we give nux or strychnine as nerve
stimulants, the bitter tonics and good food.

The diagnosis will take the same course in acute paraplegia, and the same means will be used in
its treatment.

When it has been preceded by an injury, or by inflammation, we wish to determine as nearly as
possible the condition of the part, and whether or not the lesion has destroyed the nerve structures.
Even here the treatment may be rational. We do that which needs doing, whether it be to promote the
removal of organized lymph, or of water, or by an increase of waste and nutrition gradually renew the
diseased structures until they are capable of doing their work.

Wrongs of the sympathetic nervous system are so intimately associated with lesion of the
vegetative functions that we find difficulty in separating them. Possibly it is only where an important part or the whole of this system is involved, that it requires special study. We may classify these lesions as an excess, defect, or perversion, though the excess is more an undue excitation than an increase of power.

We will find this excess marked in an unnatural and unaccountable frequency or hardness of pulse, and an unpleasant irritability of the organs of digestion and secretion. There can be no improvement until we can have better innervation. In such cases veratrum has a most excellent action, and, followed by arsenic, will frequently effect cures in very stubborn cases.

Defect is marked by a feeble circulation, the artery giving the sensation of want of tone or elasticity, and all the vegetative functions are feebly and imperfectly performed. That it is not due to a wrong of the organs themselves is readily determined by other symptoms. In these cases the needed remedy must be selected by the special symptoms. Perversion of sympathetic innervation is shown by irregularity in the performance of the vegetative functions, and by changes in the character of the pulse, other than frequency, strength or feebleness. The remedies will be selected in accordance with specific indications presented.

The association of the sympathetic with the spinal nervous system gives us that condition of disease known as spinal irritation. It is of frequent occurrence in chronic disease, and, when marked, is sufficient to prevent a cure by the ordinary means, being a continued source of wrong innervation. It is a little singular that the source of this lesion of the spinal cord should always be an organ supplied from the sympathetic, and that irritation should be so readily propagated backward along these nerves.

Yet it is a fact that a disease of irritation cannot exist long in an organ without some disturbance of the great sympathetic, and the spinal cord immediately behind the ganglion, that furnish the nervous supply.

Spinal irritation is usually marked by tenderness on pressure over the bodies of the vertebrae, and when such tenderness is found it is taken as evidence of this lesion. But once in a while we will find the evidence at some distance from the spine, but always in the course or termination of the posterior spinal nerves."

It was proposed by Prof. John King to determine the locality of chronic visceral disease by an examination of the spine, and this can be done where there is spinal irritation. If the reader will refer to a text-book on anatomy, he will see that the distribution of sympathetic nerves and connection with the spinal cord is very simple. The sympathetic ganglia send off large nerves, which before their distribution form a network, called a plexus, and from this the nerves are distributed upon the nearest arteries. Thus if we know the source of nerve supply to a plexus, and the distribution of the arteries nearest to this, we will readily make the association between a particular part of the spinal cord and a special organ or organs. It might be remarked that the connection between the cord and the ganglia which lie upon the bodies of the vertebrae in front, is immediately backward and forward by filaments of communication, and that a limited portion of the gray substance of the cord is thus associated in action with a ganglion.

The first cervical ganglion sends its branches upwards on the carotids, to supply the brain and the organs of special sense; and a nerve downward, which through the cardiac plexus is distributed to the heart; thus to a certain extent associating the brain and heart in action. The other cervical ganglia send nerves downward to the cardiac plexus, which supplies the heart and to some extent the lungs.

The upper dorsal ganglia send off the great splanchnic, which, passing through the diaphragm, forms the solar plexus, and from this the nerves are distributed upon the creliacaxis to the stomach, liver and spleen, and upon the superior mesenteric to the small intestine and pancreas.

Branche's from this pass downwards upon the spermatic artery to the testes in the male and the ovaries and uterus in the female. The lower dorsal ganglia furnish the lesser splanchnic nerves, which form above the renal arteries the renal plexus, and furnish nervous supply to the kidneys, ureters and bladder. The dorsal ganglia furnish nerves for the formation of the hypogastric plexus, which gives nervous supply to the pelvic viscera. The sacral ganglia furnish nerves for the sacral plexus, which supplies some parts at the outlets of the pelvis, and the lower extremities.

The above is but a brief synopsis of this subject, and the reader will do well to give it a thorough study, and trace out the distribution of these nerves on an anatomical plate. It will be found that there is a free intercommunication between the different parts, some more especially than others, and thus many sympathies observed in health and disease can be accounted for.

It will here be necessary to determine the exact condition, for it is not always the same. Possibly our old division will serve our purpose, classifying them with reference to vascular excitement and enfeebled circulation, or anemia. The case of vascular excitement will be shown in the bright eyes and contracted pupils, slight increase of temperature, and a pulse that has hardness and
undue vibration as an element.

The case of anemia of the cord will be recognized by the dull, sunken eye, feeble circulation to the surface and extremities, and a pulse that wants strength. In many of these cases the skin is relaxed, and there is undue exudation. Cases are occasionally seen which are marked by a full, sluggish and oppressed pulse, dull eyes and dilated pupils. The treatment in these cases should be selected in accordance with the symptoms presented.

CHAPTER XIII.

THE DISCHARGES IN DIAGNOSIS.

IT is well to give careful attention to the discharges from the human body, for they not infrequently tell a story of more or less diagnostic value. The discharges from the nose are of local significance, and indicate changes of function and structure in these cavities.

In measles and typhus, catarrhal symptoms are among the most prominent, and in the first are almost pathognomonic; but these and epidemic influenza are the only instances where the disease is referred to the blood.

The thin, glairy secretion is evidence of irritation and determination of blood; the white of egg-looking mucus, of active inflammation, and an indication for kali mur. The yellowish, glairy discharge of commencing suppuration-muco-pus-is well treated with calcarea fluorica and kali phosphoricum, and the opaque, yellowish, non-tenacious secretion, of the subsidence of inflammatory action, by kali mur.

Dryness of the anterior nares is usually referred to scanty or arrested lachrymal secretion; too much moisture of the anterior nares, thin, watery, to increased lachrymal secretion. For the dryness calcarea fluorica and kali mur. have been employed with much success, and in the thin, watery discharge, kali sulphuricum and natrium muriaticum are useful remedies.

In chronic disease of the nasal cavities the condition of the parts is pretty clearly shown by the character of the discharges, which have the entire range of mucus, muco-pus and pus. In determining the diagnostic value of these discharges, we will be guided by the same rules as in other situations. We wish to know the physical properties of normal mucus, and of normal pus, and we then will have a standard of comparison. In acrid discharges from the nose silica will prove the needed remedy.

The discharges from the mouth proper are of saliva with some mucous secretion. But through the mouth we have all the discharges from the respiratory tract below, of mucus, pus, blood, exudative material, etc. We also have occasionally discharges from the digestive tract, the stomach, upper small intestine, and secretion from the liver.

The saliva normally is a thin, transparent, slightly viscid fluid, with a marked alkaline reaction to litmus paper. If it loses these properties in degree, or is increased, we will conclude that the first act of digestion is improperly performed. Physicians have not been properly impressed with the importance of buccal digestion, and frequently direct their remedies to the stomach when it is not at fault.

Dryness of the mouth evidences arrest of secretion, and necessarily impairment of the digestive process. If the salivary secretion is found to be scanty, we anticipate a wrong of digestion, especially of starchy foods, and a wrong of nutrition. It is usually associated with excitation of the nerve centers, and local disease presents unusual irritation. We have the same results where the saliva is constantly thrown off in chewing and smoking.

Increased secretion of saliva is found as a symptom in some forms of chronic disease, and occasionally in acute disease. If marked, it interferes with digestion, and is a cause of depravation of the blood. The tendency is always to low grades of albuminoid deposits-cacoplastic or aplastic. In acute disease the remedies will be the alkaline sulphites or sulphurous acid, or sometimes chlorate of potassium, or natrium muriaticum. Quinine and nux vomica are thought of for the wrong of innervation, and hydrastis, aconite, ipecac, ferrum phosphoricum and podophyllin for the wrongs of the intestinal canal. The same remedies will be applicable in chronic disease, and in addition we may think of phosphorus, sulphur, and sometimes arsenic.

It is hardly worth while to speak of changes in the character of saliva as regards its viscosity, as it is always associated with excess in quantity, and the indications for remedies will be as above. Attention should be called, however, to the need of antiseptics in these cases, for very surely we will have sepsis as a prominent feature in the progress of acute disease.

If the proper antiseptic is selected, whether sulphite of sodium, sul-phurous acid, chlorate of potassium, baptisia, echinacea, or muriatic acid, this symptom will pass away.

The reaction of the secretions of the mouth to test paper will be found to vary, and this will sometimes indicate the class of remedies to be selected. The alkalinity may be markedly increased, and acids will be associated with remedies to influence the digestive process.
In such a case, with dyspepsia, muriatic or lactic acid, largely diluted, with the addition of a small portion of nux, will cure when the ordinary means have failed.

In infantile dyspepsia we sometimes find the saliva neutral, or in rare cases the secretions of the mouth are slightly acid. We find the same conditions in the adult, though not so often nor so marked. In such cases we would give hydrastis and natrium phosphoricum, and expect the patient to amend rapidly.

Ejections from the stomach as a result of disease sometimes afford valuable information. Eructations in dyspepsia are very acid or feebly acid. The first is very common, and is usually met by an alkali or bismuth, though experience shows that this is not good treatment. It is associated with hyperesthesia, demanding aconite, hydrocyanic acid, rhubarb, ipecac and like remedies. The second evidences a condition of atony, and suggests muriatic and lactic acids, with hydrastis and similar bitters, podophyllin, etc.

Eructations containing a yellowish or yellowish-brown coloring material, and of a bitter taste, show irritation of the upper small intestine, and sometimes an irritation of the entire chylopoietic apparatus. The remedies will be chionanthus, kali muriaticum, and such as prove sedative to these parts.

Blood in the discharges has a variable significance. If in small quantities, during violent vomiting, we may conclude that some minute vessels have given way; if dark-colored and clotted, we conclude there is passive hemorrhage-usually from congestion, except in the rare case of ulceration, with erosion of some of the vessels, when the discharge may either be of bright or clotted blood. In passive hemorrhage ipecac will prove efficient.

Vomiting of considerable quantities of mucus is occasionally noticed in persistent atonic dyspepsia, and its therapeutic value will be obvious. Vomiting of pus is at once referred to ulceration, the result of chronic inflammation, and calls for natrium phosphoricum.

The "black vomit" of yellow fever, and some rare cases of congestive, intermittent and remittent fevers, shows the breaking down of the blood, as well as the congestion of the digestive mucous surfaces. The remedies here suggested are Echinacea and small doses of ipecac.

The discharges from the respiratory tract are of mucus, pus, blood, and the material of exudation. We wish to have a clear idea of the origin and value of these discharges, and senses trained to recognize them when seen. In health the respiratory mucous membrane is continuously lubricated with mucus, but it is not in quantity to be discharged by mouth; even the increase of quantity is evidence of disease.

If mucus is thin, glairy, and very tenacious, we know that it comes from a mucous membrane in a condition of great vascular excitement-inflammation. The more marked these properties, the more active the excitement. We see it in minor degree in catarrhal bronchitis when secretion is first established. The typical remedies are veratrum and bryonia.

The opaque mucus, not so tenacious, is associated with a subsidence of the inflammation and resolution. The quantity may be such as to enfeeble the part or the patient, but other than this it is regarded as a favorable symptom. The reader must not suppose from this that abundant opaque mucous discharges are essential to recovery, for they are not, and the patient convalesces better if the discharge is never in excess, and but little changed in character. The typical remedy is ipecac. Change of color evidences local structural disease, and disease of the blood, whatever the color may be. Shades of yellow and green show suppuration—the discharge is more or less purulent. Shades of brown, if not from blood in this discharge, show a low grade of inflammation and impairment of the blood.

In some of these cases the discharges look like "prune juice," or still worse, like the washings of spoiled beef. The remedies here indicated are echinacea and baptisia. Globular sputa is characteristic of pneumonia, as the glairy, tenacious mucus is of bronchitis. So marked is this character of the expectoration in inflammation of the parenchyma of the lungs, that it is evidenced not only in the single portions of mucus expectorated, but when the patient spits in a vessel they all run together to form a globular mass.

The cheesy expectoration, lacking consistence, seeming to be somewhat granular, is usually regarded as tuberculous. Whilst there are exceptions, it is probable that it may usually be regarded as evidencing aplastic or cacoplastic deposits, and a condition favoring tuberculosis, if it is not broken down tubercle.

Masses of desiccated mucus are sometimes expectorated that are well calculated to deceive. They are in larger and smaller granules, and fully meet the popular idea of tubercular deposit. Yet when we take a portion and soften it with water on a glass, it gives the glairy, tenacious mucus, and not the friable tubercular matter. These little bodies are evidently from accumulations in mucous follicles, principally in the larynx, which are forced out in the act of coughing.
Pus from mucous membranes will in appearance take the entire range of this product. It is usually admixed with mucus, and thus has greater consistence. It is laudable, or bad, thin, thick, bland, ichorous, yellow, green, brown, etc. It evidences local destruction, though it may be but superficial, the relationship between mucus and pus being very intimate. The gradations of pus have the same significance here as elsewhere.

Blood may be discharged from the throat and pharynx, from the stomach, from the larynx, and from the lungs. From the throat and pharynx it is of usual color, is not frothy, and is ejected by an act of the will. Blood from the stomach is of darker color, is sometimes admixed with food and the secretions of the stomach, or is in part clotted. Blood from the larynx is but little frothy, is of usual color, and is in part discharged by an act of will. Blood from the lungs is usually bright, frothy, and wells up into the mouth without the consciousness of the patient.

We always want to know whether hemorrhage is active or passive, as the treatment will depend upon this. Very fresh and bright blood would evidence active hemorrhage, whilst deeper colored blood would evidence passive hemorrhage. Yet we will find better evidence in the color and expression of the face and in the pulse. Active hemorrhage calls for Veratrum and styptics, whilst passive hemorrhage refers us to erigeron, ipecac, gallic acid and ergot.

Mucus streaked with bright blood evidences inflammation, and is seen in sthenic bronchitis. If the blood is less bright it evidences a lower degree of inflammation, or rather impairment of the life of the part, and if it assumes the "prune juice" character, it evidences an unpleasant condition.

The blood in the sputa of pneumonia is rusty, and may be found perfectly admixed with the mass of mucus, or forming a central nucleus. If here it becomes brown, or has the "prune juice" character, it evidences a low grade of inflammatory action and impairment of the life, and calls for baptisia and bryonia.

We occasionally see exudative material. First, as fibrinous exudations from the mucous surfaces, in croup and in croupous bronchitis; second, as broken down material from the parenchyma of the lungs. The last is sometimes very characteristic, but at others it is so masked by the bronchial secretions and by the breaking down of the structures that we can hardly recognize it. Call it cheesy, friable, and the fluid differing in character from laudable pus in consistence, color, etc., and the reader will get a fair idea of it.

The discharges from the bowels also have a story of some interest to tell. We will, therefore, give them due attention, and so arrange our inquiry in regard to the feces that it will have reference, first, to the increase or diminution of the secretion; second, to the condition of the intestinal canal as an apparatus for digestion; and third, to any abnormal constituent or marked change in the character of the excretion. Increase of the feces, in proportion to its extent and duration, causes debility; for histogenetic material, either as food or tissue, is proportionately removed.

Fluid feces, whilst very frequently in excess, as above, deserve attention more particularly as evidencing such lesion of the intestinal canal as interferes with digestion and blood-making; and also with that due degree of distension of the blood-vessels which is necessary to proper circulation.

Deficiency of the feces may depend upon the quality of the food, or upon its quantity; the largest proportion of fecal material being furnished by the debris of food; or it may depend upon an arrest of secretion, in which case we will have the same constitutional evidence that we would have in similar arrest from the skin and kidneys; or it may be dependent upon atony of the intestinal canal, which allows the material to accumulate, without the natural effort at removal.

Simple constipation gives rise to derangements of digestion, and the retention of effete material in the bowels occasions a feeling of malaise and dullness, with headache and fever, in so far as they are retained in the blood, or reabsorbed. The color of the discharges is sometimes of importance in determining the character of the disease. The natural color, like the natural fetor, evidencing a condition of the intestinal canal in which its functions may be properly performed.

The dark-brown or almost black color of the feces, observed in typhoid disease, arises from the excretion of the coloring material of the blood, the red globules being broken down rapidly.

The use of iron in any of its forms, and occasionally of sulphur or its salts, will darken the color of the feces. The dark green color of the feces that followed the administration of mercury, and was thought to be bile, was due to the formation of sulphuret of mercury. Greenish discharges are generally dependent upon an increase of acid in the intestinal canal, with irritation and consequent indigestion. It may in part be dependent upon the coloring matter of bile, which is thrown off by the feces in consequence of such irritation.

Clay-colored discharges refer to a general want of secretion; not only of the solitary glands of the intestine, but of the associate viscera. It is an atonic condition, with impaired innervation and circulation.
The natural odor of feces seems to be dependent upon a special secretion in the neighborhood of the cecum. It may be regarded as an evidence of normal activity throughout the entire intestinal tract.

Diminution of odor is an indication of want of functional activity, as an increase will indicate increased activity. Fetor refers to decomposition of the intestinal secretions. It varies greatly from local causes, and cannot be relied upon as indicating any special condition of the general system. The cadaverous fetor may, however, be taken as evidencing a septic condition, not only of the intestinal secretions, but also of the fluids and solids.

It being somewhat difficult to determine changes in the elements of feces, and such determination not often being necessary in ordinary examinations, we will not enter further into the subject than to give the following quotation from Prof. Lehman's "Chemical Physiology".

"The excrements in consumption are sometimes found to contain more fat than usual. Sugar is occasionally found in the feces of diabetic patients. The stools are found to be black, chocolate-colored, or tar-like, when blood is contained in them, and this arises from the upper intestinal canal; so also the semi-liquid, green excrements, which are observed occasionally in typhus and other diseases, depend upon blood, which is easily recognized by the microscope. Soluble albumin is found in the stools in dysentery, typhus, and occasionally in Bright's disease and in cholera.

The greatest quantity of epithelial cells is found in the dejections of cholera. Cytoid corpuscles are very numerous in the excrements in catarrhal diarrhea, in dysentery, and occasionally in typhus and cholera. Hyaline mucus is observed in the excrements in catarrh of the large intestine; it arises from the follicles of the colon, and contains round or oval pale or granular cells and cell nuclei. Fibrinous exudations occur in the feces in follicular ulceration and in dysentery."

The discharges from the urinary apparatus will be fully studied in a separate chapter.

CHAPTER XIV.
THE URINE IN DIAGNOSIS.

The urine is the most important fluid excretion, for by it nearly all of the nitrogen of the used up proteid leaves the body in the form of urea. It may not, therefore, prove devoid of profit to briefly review the leading processes connected with the excretion of urine, before considering the importance of its careful examination as a means of diagnosis.

The Construction of the Urinary Glands.

The kidneys may be called complex and tubular glands, because the tubes of which they are composed are made up of a number of parts essentially differing from one another, both in their structure and in their relation to the blood-vessels.

The tubes begin by a small, rounded dilatation-called the Malpighian capsule-which is lined by thin, flattened epithelium. Opening from this capsule is found a tortuous tubule, lined by peculiar, large, rod-beset epithelial cells, which occupy the greater portion of its diameter. This convoluted tubule leads into a tube of much less external diameter, but about equal lumen, owing to the thinness of its lining epithelium, the cells of which are more flattened and much thinner than those in the tortuous tubes. This thin tube forms a loop extending down into the medullary pyramid and returning to the cortex, where it can be seen to become again consolidated and then to open into a straight collecting tube.

The collecting tubes receive many similar tributary tubes on their way toward the apex of the Malpighian pyramid, where they pour their contents into the pelvis of the kidney. The epithelial lining of these collecting tubes is of the ordinary cylindrical type.

It is thus found that there are four kinds of epithelial cells in the various parts of the urinary tubules, namely: scaly cells in the capsule; peculiar, rod-beset glandular cells in the convoluted tubes; flattened cells in a great part of the loop; and ordinary cylindrical cells in the large straight tubes.

The renal artery, on its way from the hilus to the boundary between the cortical and medullary portions of the kidney, breaks up suddenly into numerous small branches; these vessels then form arches which run along the base of the pyramids. From the latter, straight branches, called interlobular arteries, pass toward the surface, and give off lateral branches, which form the afferent vessels to the neighboring Malpighian capsules. Within the capsules the afferent arteries at once break up into a series of capillary loops, forming a kind of tuft of fine vessels, the glomerulus, which fills the cavity of the beginning of the tubules, and is only covered by thin, scaly epithelial cells, and thus separated from the urine. It is a singular fact, that in the renal circulation the efferent vessel, on leaving the glomerulus, does not, like most veinlets, unite with others to form a large vein, but again breaks up into capillaries... which form a dense network around the convoluted tubules. The blood is thence conveyed...
Another striking peculiarity of the renal vessels is that a distinct set of arteries, starting from the same point as the intralobular (between the cortex and medulla), pass toward the center of the gland into the pyramids. They consist of branches of straight arterioles, which lie between the straight and the looped tubules. Corresponding with these straight arteries are minute straight veins, which carry the blood back to the vessels at the base of the pyramids.

In the kidney, then, we have three sets of capillary vessels, which differ in their position, the form of their meshes, and their relation to their parent artery. Probably the pressure exerted by the blood in them, and the rapidity of its flow through them, differ also in

1. The capillaries in the glomeruli are loops collected into a tuft by their covering of delicate epithelium. On account of their relation to the afferent artery, which ends abruptly in these capillaries, and to the smaller efferent vessel that leads to a secondary plexus of capillaries, the pressure within the glomerulus must be very great compared with that of the general capillaries of the body, and must vary much with changes in local blood pressure;

2. The secondary capillary plexus, with its narrow meshwork closely investing the tubules, can only be under comparatively trifling pressure, which varies but little, on account of the blood having first to pass through the capillaries of the glomerulus. Their current of blood must also move slowly, since the bed of the stream is here very great.

3. The straight vessels, with long-meshed capillaries, in the pyramids between the looped and straight tubules, are unlike the two preceding. In these straight vessels the blood probably flows with greater velocity than in those around the convoluted tubes; and their blood-pressure is less than that in the glomeruli, but greater than that in the inter-tubular capillaries.

The Urine.

When freshly voided the urine of man in health is a clear, straw-colored fluid, with a peculiar aromatic odor. The intensity of the color varies with the amount of solids which it contains—the color being a rough indication of the degree of concentration. On standing and cooling, a slight cloud of mucus often appears floating in the fluid. This comes from the lining membrane of the bladder, and it usually entangles a few flat-tened epithelial cells, which are the only organized structural elements found in normal urine.

The fresh urine has a distinctly acid reaction. This does not depend upon the presence of free acid, as is suggested by the fact that no precipitate is found on the addition of sodium hypersulphate, but upon the large amount of acid salts, particularly acid sodium phosphate, which it invariably contains. A strictly vegetable diet renders man's urine alkaline.

The specific gravity of urine varies greatly at different times, commonly, however, ranging between the figures 1015-1020. After drinking a large quantity of liquid it may go as low as 1003, and after prolonged abstinence from liquids, or very active sweating, it may attain 1040.

The quantity of urine secreted is also somewhat variable, that produced by an adult usually amounting to about two pints in the twenty-four hours. The amount is increased by (1) elevation of the general blood-pressure or the pressure in the renal vessels from any cause whatever; (2) contraction of the cutaneous vessels from cold; (3) copious drinking; (4) excess of nitrogenous diet; (5) the presence of soluble matter in the blood, such as sugar, salt, etc.; and (6) the presence of urea, as well as various medicaments, has a special action on the renal secretion, greatly increasing the amount of urine passed.

Although the quantity of urine differs so much under different circumstances, the amount of solids excreted by the kidneys in the twenty-four hours remains very nearly the same, being on an average over one and a half (10) ounces for an adult man. From this it is obvious that the height of the specific gravity must vary inversely with the amount secreted, so that the more scanty the urine the higher we expect to find the percentage of solids.

Secretion of the Urine.

It has just been seen that the arterial twig, or afferent vessel, which enters the capsule of Malpighi, breaks up into a set of capillary loops, which are only covered by a single layer of extremely thin epithelial cells separating them from the lumen of the urinary tubule, and that the pressure in the vessels of the glomerulus is habitually higher than in most capillaries, and constantly greater than that
of the second capillary network around the convoluted tubules.

The general arrangement of these vessels, and the high pressure in the glomerulus, give the impression that it is simply a filtering apparatus by means of which the fluid parts of the blood pass into the urinary tubules. This view seems supported by the fact that the quantity of urine bears a direct proportion to the blood-pressure in the minute renal vessels, whether the change in pressure depends on local vascular mechanism or on changes in the general blood-pressure.

But such a theory, as has been well pointed out by Prof. Yeo, cannot adequately explain the formation of urine, because the urine differs materially from the fluid which can be obtained as a filtrate from the blood. In health it contains no albumin, a substance in which the blood is very rich, and it has enormously more urea and salts than the blood.

There is, therefore, both a quantitative and a qualitative difference, which implies a distinct process of selection, and although filtration cannot be altogether excluded from the process, it must be completely modified by other forces.

Moreover, in the general description of the kidney, we have just seen that, in a great part of the tubules, both the epithelial and vascular supply give the idea of actively secreting gland tubes. From the mere construction of the different portions of the gland it has been concluded that there are two distinct departments, each of which plays a different part in the production of the urine. One is a simple filtering mechanism, and the other a definitely secreting glandular tubule.

It is not surprising that, with such a complex arrangement as the tubules above mentioned, there should exist different views as to the exact mode in which the urine is secreted. For a detailed enumeration of the different explanations of the method of secretion of the urine the reader is referred to any of the standard works on physiology.

Chemical Composition of Urine.

The percentage of the various materials in urine varies as the secretion differs in strength, as mentioned, but on an average it may be said to contain about 4 per cent. of solids and 96 per cent. water.

The following are the more important solid matters:

Urea is the most important, and at the same time most abundant solid constituent, commonly forming about two (2) per cent. of the urine. It is regarded as the chief end-product of the oxidation of the nitrogenous matter in the body, so that the amount excreted in the twenty-four hours gives us the best estimate of the amount of chemical change taking place in the tissues. It is readily soluble in alcohol and water, but insoluble in ether. It forms needle-shaped crystals with a silky lustre.

On exposure to the air bacteria develop in the urine, and, acting as a ferment, change the urea into ammonium carbonate. This gives rise to a change in the reaction of the urine, which after a time becomes increasingly alkaline, and the change is usually spoken of as alkaline fermentation of the urine.

The amount of urea eliminated in the twenty-four hours is about 500 grains. The amount varies (1) in some degree with the amount of urine secreted; an increase in the amount of water being accompanied by a slight increase in the urea eliminated. Some materials, such as common salt, increase the water, and thereby also increase the urea. (2) The character and quantity of the diet influences most remarkably the quantity of urea given off, the amount increasing in direct proportion to the quantity of proteid consumed. Fasting causes a rapid fall in the amount of urea; even in the later days of starvation it continues to fall, but very slowly. (3) The amount differs with age, being relatively greater in childhood than in the adult (about half as much again in proportion to the body weight).

(4) Many diseases have a marked influence on the amount of urea. In most febrile affections it increases with the intensity of the fever, while in diseases of the liver it often notably decreases.

In diabetes, if the consumption of food be very great, the daily excretion of urea may reach nearly four ounces, or three times as much as normal.

Uric acid is present only in extremely small quantities in the normal urine. It is sparingly soluble in water, and insoluble in alcohol and ether. In solutions of the neutral phosphates and carbonates of the alkalies it combines with some of the base so as to form acid salts, and at the same time converts the neutral into acid phosphates, to which the urine owes its acid reaction.

These salts are more soluble in warm than in cold water, and hence generally fall as a sediment when the urine cools. The amount of uric acid normally follows very closely the variations in urea, but is usually only about eight grains in the twenty-four hours. In certain diseases the quantity may be much increased.

Kreatinin is always present in urine, probably being formed from kreatin by the loss of one
molecule of water. About fifteen grains is the amount excreted in the twenty-four hours. Hippuric acid is a normal constituent of human urine, occurring, however, in very small quantities. The amount of hippuric acid increases with increased consumption of vegetable food, in the cellulose of which the materials exist that are required for its formation.

Xanthin also occurs in urine, but in extremely small quantities.

Oxalic acid occurs often, but not constantly, in the urine. It is generally united with lime. It is said to appear in greater quantity, together with an excess of uric acid, after meals, and therefore to be related to the production of the latter in the body; but it is probably derived from oxalates being contained in some material taken with the food.

**Coloring Matters.**

It appears probable that the color of the urine depends on the presence of small quantities of distinct substances which have different origins in the body. Three such have been described, and may be taken provisionally to represent our knowledge of the subject.

1. Urobilin, which is an outcome of the coloring matter of the bile, and therefore a remote derivative of the coloring matter of the blood, is frequently present in the urine. It is probably the same as hydrobilirubin, some of which is occasionally absorbed from the intestinal tract and eliminated by the kidneys.

2. Urochrome is said to be the special pigment of the urine. It oxidizes on exposure, forming a reddish substance that gives the dark color to some urinary sediments (troerythrin).

3. A certain material (indican), capable of producing indigo, is commonly present in the urine of man, and in greater quantity in that of some animals, particularly the horse. It is supposed to be formed from the indol that arises from the putrefactive changes consequent on the pancreatic digestion. The indol is absorbed and unites with sulphuric acid to form indican, which is a yellow substance. Under certain conditions it can be converted by oxidation into indigo blue.

**Inorganic Salts.**

The urine is the great outlet for all inorganic salts. The most important of these are:

- Common salt, of which a very variable, but always considerable amount passes away in the urine.

  The average quantity excreted in the twenty-four hours may be said to be about half an ounce. It depends greatly on the quantity taken with the food, and falls during starvation, but does not completely disappear. It is said that if absolutely no sodium chloride be taken with the food the quantity excreted diminishes greatly, and that albumin appears in the urine about the third day. The amount of salt eliminated follows, with striking accuracy, the changes that take place at different times and under different circumstances, in the quantity of urea excreted. These facts seem to indicate that there is some relationship between the secretion of the two bodies, or that sodium chloride participates in the chemical changes of the nitrogenous tissues.

In many diseases there occur variations in the quantity of common salt in the urine, which can hardly be explained by the change in or absence of food.

- Phosphates.-About sixty grains of phosphoric acid is excreted daily in the urine, being combined with alkalies to form salts, namely: potassium, sodium, calcium and magnesium phosphates.

- Sulphates.-Nearly forty grains of sulphuric acid, as sulphates of alkalies, are daily excreted in the urine. The acid comes partly from the food, but chiefly from the oxidation of the sulphur contained in the proteids of the tissues. A considerable quantity of potassium, sodium, calcium and magnesium, combined as heretofore mentioned, or with chlorine, is contained in the urine.

- Iron.-Small traces of iron are also always present in the urine.

**Gases.**-The urine also contains free carbonic acid gas (carbon dioxide), nitrogen and some oxygen.

**Abnormal Substances in the Urine.**

Different kinds of substances occur in urine under circumstances of interest. The most important of these is:

- Albumin, which occurs from (1) any great increase in the blood pressure in the renal vessels, whether caused by increased inflow or impeded outflow. (2) Excess of albumin in the blood, and, strange to say, some forms of albumin escape much more readily than others. Thus, egg albumen, globulin or peptone, if introduced artificially into the blood, is soon found in the urine. (3) A watery condition of the blood, as would give rise to edema elsewhere. (4) Total absence from NaCl for some time. (5) Extensive destruction of the epithelium of the urinary tubes.

Next in importance to albumin are the following:
Grape sugar, of which normally only the merest trace occurs in the urine, although there is always a certain quantity in the blood. It is present in large quantities in (1) the disease known as diabetes, when a great quantity of pale urine with a very high specific gravity is passed. (2) After injury of a certain part of the floor of the fourth ventricle of the brain. (3) After poisoning by curara, carbonic oxide and nitrite of amyl. In short, any disturbance of the circulation of the liver gives rise to an increase of sugar in the blood, and when the amount reaches 6 per cent, it appears in the urine.

Bile acids and pigments appear in the urine when, from occlusion of the bile ducts, they find their way into the blood.

Leucin and tyrosin also occur in the urine, but only after profound interference with the function of the liver. The urine undergoes important changes after being voided, the explanation of which is of much interest to the practitioner, and must be understood by the student of medicine. (1) Commonly enough the urine loses its transparency as soon as it gets cold, though perfectly clear when passed, or when again heated to the body temperature, for the urates are soluble in warm but almost insoluble in cold water. This "muddiness," which soon settles down, as a more or less brightly colored sediment, is chiefly caused by the precipitation of acid sodium urate, stained with a coloring matter derived from the urochrome.

When this occurs the urine will always be found to be distinctly acid, and if it be left standing for some time in a cool place, the acidity will be found to increase, owing to the presence of a peculiar fungus which sets up acid fermentation.

This is said to depend on the formation of lactic and acetic acids, and crystals of uric acid, amorphous sodium urate, and crystals of lime oxalate are deposited.

After a certain time (which is shorter when the urine is not very acid and is exposed to a warm atmosphere) the development of bacteria occurs in it, and causes the urea to unite with water, and to change into ammonium carbonate. This gradually neutralizes the acidity, and finally renders the urine alkaline. At the same time an amorphous precipitate of lime phosphate appears, and crystals of ammonio-magnesium phosphate and of ammonium urate are produced.

**Urinary Calculi.**

Various ingredients of the urine, which are difficult of solution, sometimes become massed together as concretions, particularly if there exist any small foreign body in the bladder which by acting as a nucleus lays the foundation of a stone. Sometimes small concretions are formed in the tubes or pelvic recesses of the kidney, and, when these make their way into the bladder, they commonly grow larger and larger. The structure and composition of a calculus often give the history of its own transit from the kidney, and also of various changes in the metabolism of the individual, for successive layers of different substances are generally found in a stone that has attained any great size. The chief materials found in calculi are: Uric acid, ammonium urate, calcium oxalate and carbonate, ammonio-magnesium phosphate, etc.

**Nervous Mechanism of the Urinary Secretion.**

With regard to the influence exerted by the nervous system on the renal secretion, we have but little satisfactory information, although there can be no doubt that here, as in other glands, the process is under the control of the nerves. Many of the circumstances which cause greater activity of secretion, such as taking large quantities of water, etc., have no effect on the general blood pressure, so that, if the increased flow be brought about by the vasomotor mechanisms, it must be by means of nervous channels altering the blood-flow in the special arteries of the glands. We know, further, that emotional conditions, such as hysteria, exist in which an unaccountably great quantity of urine of a very low specific gravity is evacuated.

With regard to the effects of the vasomotor nerves, we know that section of all the nervous twigs going to the kidneys causes great congestion and an immense increase in the secretion, which commonly contains albumin.

This, no doubt, depends on the sudden rise in pressure in the glomeruli, owing to the dilatation of the arterioles. If the splanchnics, in which the renal vaso-motor nerves run, be cut, a great quantity of urine is produced from the same cause-vasomotor paralysis—but, on account of the large area of vessels injured, the general blood pressure falls, and, therefore, the effect is not so much marked. If the peripheral end of the cut nerves be stimulated, the secretion is diminished, and, owing to spasm of the renal arterioles and fall of blood pressure in the glomerular capillaries, may be brought to a standstill.
Section of the spinal cord at the seventh cervical vertebra stops the flow, because it so reduces the general blood pressure that the pressure in the renal vessels falls below that necessary for the filtration of the urine.

**Passage of the Urine to the Bladder.**

The pressure exerted by the blood in the glomerular capillaries is quite sufficient to make the urine flow from the pelvis of the kidneys into the bladder. Normally, however, the passage of the urine along the ureters is accomplished by the peristaltic motion of the ducts, which goes on alternately in the two ureters, so that the urine flows into the bladder at different periods from the right and left kidney.

The ureters have a strong middle coat of smooth muscle along which a wave of contraction, lasting about one-third of a second, passes rhythmically in about six to ten seconds from the pelvis of the kidney to the bladder. Having reached the bladder, the urine cannot return into the ureters on account of the oblique way in which these ducts pass through the walls of the bladder. When the pressure in the bladder increases, the opening of the ducts becomes closed and acts as a kind of valve.

The ureter, which is continuously secreted and rhythmically conveyed to the bladder, is only voided at convenient seasons; therefore special arrangements exist for its retention and expulsion.

The retention of urine in the bladder up to a certain point depends on the elasticity of the parts concerned, the dense elastic tissues around its outlet being able to resist the elastic force exerted by the viscera and the walls of the bladder upon its contents. Thus, where no active muscular forces can possibly come into play, as in the case of a dead subject, or in complete paralysis following destruction of the spinal cord, a considerable amount of urine is retained.

But when a certain pressure is attained by the gradual accumulation of urine within the bladder, the elasticity of the sphincter and the other tissues around the outlet is overcome by the elasticity of the bladder wall, and the urine slowly dribbles away.

In the normal condition there are two sets of muscular mechanisms which aid the elastic forces just named. They may be regarded as antagonistic—the one, the sphincter muscle, by contracting, strengthens the elastic power of the tissues around the urethra, which retains the urine; the other, formed by the muscle coat of the bladder, called the detrusor urinac, is the chief agent in actively expelling the urine. When these muscles are in good working order much more urine can be conveniently retained than the elasticity of the tissues about the urethra would permit of. If the spinal cord be destroyed the bladder can only retain about one-third the quantity of urine it conveniently holds when the cord is intact. We must, then, suppose that the sphincter muscle acts more powerfully when the elastic forces are equalized.

The accumulation of urine after a certain time gives the sensation known as a full bladder, but this feeling is not necessarily accompanied by any immediate call to make water, though it sometimes produces a desire in that direction. We suppose, then, that the stimulus given to sensory nerves by filling the bladder causes reflexly a constriction of the sphincter muscle, so that in proportion as the pressure within the bladder increases the resistance to its outflow is also augmented. This does not imply any automatic action of the sphincter vesice, but merely a constant reflex excitation of that muscle, which secures its contraction and the retention of a considerable amount of urine without the intervention of voluntary influences or attention.

**Micturition,** or the expulsion of the urine, does not normally ever depend on elastic forces alone, as in the case of paralytic incontinence, when the urine commences to dribble away as soon as a certain pressure is attained within the bladder.

When the bladder is full, the elastic forces tending to expel its contents increase, and the resistance is proportionately augmented. Under ordinary circumstances, then, there is a combat going on between the expelling and retaining powers (neither the muscle in the wall of the bladder nor voluntary effort, however, coming into action), in which the retaining forces are just able to overcome the expelling elastic pressure. If the urine is retained for a considerable time, a moment arrives when the reflex stimulation of the sphincter no longer suffices to keep back the fluid, and the voluntary contraction of the neighboring muscles has to be called to the aid of the sphincter. Under these circumstances, if a drop of urine makes its way into the sensitive urethra, matters are greatly altered. Now, even voluntary effort does not suffice to keep back the stream, and an imperative call is made upon the local mechanisms to empty the bladder. This is accomplished by the contraction of the muscular coat of the bladder, which is excited reflexly by the stimulus starting from the mucous membrane lining the urethra. The evacuation of the bladder is then accomplished quite independently of the will by a reflex act, which may even be unconscious.

When the urine once commences to flow, it continues until the bladder is quite empty, the last
drops of urine being expelled from the urethra by rhythmical spasms of the muscles around the bulbous portion of that canal. The sequence of events will then be-stimulation of the mucous membrane of the urethra by escape of urine; contraction of the detrusor urine; relaxation of the sphincter; rhythmical contraction of the ejaculator urine; and, finally, a voluntary twitch of the levator ani and neighboring muscles.

This sequence of events may go on in sleep, as a result of slight local excitations, frequently in children, when probably the retention mechanisms are not yet well educated.

At an early age we learn, under ordinary favorable circumstances, to micturate voluntarily, and the bladder is never allowed to become so over-distended that the reflex contraction of the sphincter is insufficient to retain the urine. Almost at any time we can call forth the reflex act just described by increasing the pressure on the bladder by voluntary contraction of the abdominal muscles; the diaphragm being depressed and fixed, the muscles of expiration are put into action, and the contraction of the sphincter muscle being at the same time probably checked by the will, the power of retention is overcome.

The moment the balance of power is thus turned in favor of the expelling agencies and a drop of urine reaches the urethra, the excitation thus produced brings about the complete evacuation of the bladder without further voluntary effort.

The nervous mechanism that controls the act of micturition consists essentially of ganglionic centres which are situated in the lumbar enlargement of the spinal cord, and of two sets of nerve channels passing to and from the center. The centers may be said to be composed of functionally distinct parts—a retaining and evacuating part. The retaining center causes the sphincter muscle to contract. The evacuating center can excite the detrusor to action while the sphincter is relaxed by the inhibition of its exciting center. One set of nerve channels communicates between these centers and the urinary organs, and the other between the cord centers and the cerebral hemispheres. That which connects the special lumbar centers with the bladder contains motor (efferent) fibers of two kinds, going to the antagonistic muscles, the sphincter vesicle and the detrusor urine, respectively, and the sensory (afferent) fibers of different kinds; those going from the bladder to the nerve cells in the cord which stimulate them and cause the sphincter to remain tomically contracted, and passing from the mucous membrane of the urinary passages to these ganglionic cells in the cord are two sets, one of which excites the contractions of the detrusor urine and the other inhibits the tonic action of the retaining center.

The action of the ganglionic cells that stimulate the sphincter muscle can, to a certain extent, be either aided or checked by means of cerebral influences, so that two kinds of fibers—a stimulating and an inhibitory one—must pass from the hemispheres to the micturating center in the cord.

Those cells which govern the motions of the detrusor seem to be least under voluntary control, and are probably only stimulated to action under normal circumstances by the impulses arising from the urinary passages, and hence are simply reflex centers.

The effect of certain emotions on the act of micturition seems to show that those ganglion cells in the cord which cause the bladder to contract are connected with the higher centers. Thus, extreme terror (in a dog, at least) often causes a forcible expulsion of urine, and great anxiety or impatience seems in man often to have a checking influence, causing great delay in initiating micturition.

Pathology of Urine.

As has been previously stated, the quantity of urine normally excreted in the twenty-four hours by an adult is from twenty to fifty ounces, but it may exceed this average as a result of the ingestion of large quantities of fluids, as in the case of beer drinkers. It may also exceed the quantity named in winter, especially in individuals of sedentary habits.

It is pathologically increased in diabetes and in hysteria. It may be below the average in summer, and generally under all conditions by which the amount of perspiration and pulmonary exhalation is increased. It is pathologically diminished in acute febrile diseases, and in all diseases attended by dropsical effusions or watery discharges. Urine voided in the morning is darker than that passed at other times. The use of certain drugs imparts a peculiar color to the urine, as, for instance, rhubarb makes it a bright yellow, logwood reddish, senna brownish, and santonin orange-red or golden yellow. The pigment known as methylene blue gives the urine a peculiar blue color. It is well to mention these facts to the patient when prescribing either of the remedies named. Pathologically, the urine is rendered pale in anemia, and in those conditions which produce an increase in the quantity, and it is similarly heightened in color under those conditions in which the quantity of water eliminated by the kidneys is diminished while the elimination of the solids remains normal or is increased. The presence of bile may render the urine brown, or even black.
While the specific gravity of the urine of females is usually slightly lower than in males, during pregnancy it may normally rise to 1030. After a full meal the specific gravity of healthy urine may rise to 1030.

It may be well to here point out the gradations of the specific gravities of the urine under different circumstances. They are as follows: Hysterical urine, 1005-1015; albummous urine, 1005-1015; saccharine urine, 1025-1050; healthy urine, 1015-1025.

The acid reaction of human urine is owing to the blending of animal with vegetable food. It may become alkaline by exposure to air after some days, its urea being converted into carbonate of ammonia; or it may be rendered alkaline by remedies, such as carbonate of lime or magnesia, or its acid condition may be lessened by constant vomiting in certain diseased states of the stomach, or when the urine is loaded with pus. It may also become alkaline after a full meal, the digestion of food absorbing the gastric juice.

Urea in excess often gives urine a specific gravity of 1030 to 1035. Urea is theoretically formed by the oxidation of uric acid, so when this oxidation does not take place, and there is an excess of uric acid in the system, as occurs in gout, this disease is esteemed one of suboxidation.

This substance may be detected by adding strong nitric or oxalic acid to the urine. If kept cool, nitrate or oxalate of urea crystals are formed. The former of these appear in the form of scales, which are composed of numerous rhombooidal plates; the latter also take the form of rhombooidal plates, but the angles are much less acute.

Abnormal Urinary Deposits and Their Examination.

The abnormal urinary deposits are urates or lithates, uric acid, oxalates, phosphates, cystin, leucin, tryosin, pus and mucus.

Urates or Lithates.-These substances usually consist of urate of sodium and ammonia, and are the most common urinary sediments, being occasionally passed by almost everybody. They are found in the course of most fevers, in liver diseases, in rheumatism, and in gastric disturbances, but they do not indicate anything serious. There are two varieties—the pink and the white. The pink lithate forms the so-called brick dust sediment, and is best treated by remedies which improve digestion, but the white variety indicates the need of tonics.

The lithate of ammonia is soluble in liquor potassae, with evolution of ammonia. All lithates are dissolved by heat and thrown down by cold. Microscopically, lithate of ammonia appears in feathery, amorphous bodies. The lithate of sodium sometimes forms spherical masses, from parts of which very small needle-shaped crystals of uric acid project. The lithate of sodium is commonly met with in children.

Uric or Lithic Acid.—An excess of uric or lithic acid constitutes the uric acid diathesis, the leading characters of which are gout, gravel and dyspepsia, and the urine is always decidedly acid, whilst in health it gives only a faint acid reaction.

Uric acid may occur as a deposit, which is often called the cayenne-pepper grain deposit (gravel), or as a concretion (calculus). The red color of the grains is acquired from the coloring matter of the urine. The real appearance of uric acid is white.

Uric acid is dissolved (without evolution of ammonia) by liquor potassae and liquor lithiae, but not by liquor sodae or liquor ammoniae. Uric acid is insoluble in water, but is supposed to be held in solution in the urine by the action of the phosphates.

Microscopically, uric acid usually appears as a rhombus with rounded edges, or as a dumb-bell with fringed edges, always with a yellowish or reddish color, but some crystals are at times needle-shaped.

Oxalate of Lime.—The presence of the oxalate of lime in the urine constitutes oxaluria. This salt is not found in healthy urine, but its elements, carbon, oxygen and calcium, are present, and give rise to the mulberry calculus. Oxaluria often does not indicate anything serious, but is usually associated with dyspepsia and gastric disturbances. It is not unfrequent to find, upon the same microscopic specimen, crystals of oxalate of lime lying side by side with those of uric acid.

Oxalates are dissolved by nitric acid, but not by acetic acid or by liquor potassae. Microscopically, oxalates present a white deposit, consisting of square octahedra and dumb-bells without fringed extremities.

Phosphates.—The phosphates form a white deposit, and occur in the urine under three forms, namely: (a) The triple or tri-basic phosphate, or ammonio-magnesium phosphate, appearing under the microscope in the form of triangular prisms with obliquely truncated ends.

Frequently the crystals are four-sided, and sometimes peculiar forms are observed in which two prisms appear united. (b) The basic, bibasic, or triple phosphate with excess of ammonia,
microscopically presenting stellate crystals, and therefore sometimes called the star-shaped phosphate; they after a time assume the prismatic form. (c) The phosphate of lime, occurring as rounded particles, usually clinging to the angles of the triple phosphate.

Upon adding a few drops of ammonia to healthy urine it becomes turbid, and deposits the triple salt with phosphate of lime.

Phosphaturia is the name applied to the condition in which the urine contains a considerable excess of phosphates. The presence of a small deposit of phosphates in the urine is always an indication of depression and debility, but a large quantity always shows a waste of tissue, and may be considered as caused by a breaking up of the mind and body.

The phosphates are precipitated by heat or liquor potassae. They are thus distinguished from the white lithates. They are soluble in acetic and nitric acids, and are thus distinguished from oxalates, which, although soluble in nitric acid, are not dissolved by acetic acid.

Cystin or Cystic Acid.-This substance is an organic compound of a fawn color, containing carbon, hydrogen and nitrogen, with a large and equal quantity of sulphur and oxygen (26 percent of each). It is probably a derivative of albumin, (and constitutes a form of urinary calculus, put very rarely occurs as a deposit. The urine containing it usually possesses an odor of sweetbriar. Cystin is often mixed with uric acid and the urates.

Cystin is soluble in liquor ammonic, but is re-precipitated unchanged upon the spontaneous evaporation of the ammoniacal solution.

Microscopically, the deposit exhibits six-sided color-less plates, which, if very abundant, are aggregated together so as to form superimposed plates.

Leucin and Tyrosin.-These are very rare substances, but are found in the urine in cases of acute yellow atrophy of the liver. Microscopically, leucin occurs in gland-like masses of leaves or scales, and tyrosin appears as shining, long needles clustered together.

Pus.-This substance occurs as a white deposit, and is a frequent indication of chronic pyelitis, especially when mixed with blood. Pus forms a glairy mass with liquor potassae. Microscopically, the pus corpuscles resemble the white globules of the blood, but are somewhat rougher in outline, and contain more nuclei. Some recent authorities regard them as identical.

Mucus.-This deposit also forms a glairy mass with liquor potassae, but, microscopically, the epithelial cells are easily observed. If the mucus is from the bladder, the epithelial cells are flat and scaly, but if from the urethra they are columnar. In perfectly healthy urine a slight cloudy deposit of mucus is often present.

Abnormal Urinary Constituents and Their Examination.

The abnormal constituents found in the urine are (1) blood, (2) bile, (3) albumin, and (4) sugar.

Blood.-The presence of blood in the urine is termed hematuria. Congestion of the kidneys or any part of the urinary organs, either idiopathic, or produced by cantharides, turpentine and similar substances, may cause this condition. The most frequent cause, however, is a calculus. A diseased prostate, inflammation of the bladder, or tumors in the mucous membrane, may also cause the presence of blood in the urine. Again, hematuria may occur in the course of purpura, scarlet fever and typhus fever, or it may be vicarious of menstruation. In the hemorrhagic diathesis large quantities of blood may be discharged by the urethra of the male or the female. When the blood proceeds from the bladder it generally follows a flow of urine but when from the kidney it is intimately mixed with the urine. The tests for blood consist of (1) its coagulability by heat and nitric acid, which cause it to throw down a dirty-brown coagulum; (2) its color, and the heightening of it by liquor ammoniae, a crimson tint being produced; (3) the corpuscles under the microscope; (4) the dark bands in the spectrum; and (5) the blue color produced with blood by fresh tincture of guaiacum and ozonized ether. (the peroxide of hydrogen test).

Bile.-This substance gives to the urine a dark brown color, varying in the depth of its shade according to the amount of bile present. Bile may be present in the urine from one of two conditions, namely: (1) Suppression of the biliary functions, in which case the blood is charged with the coloring matter of the bile and with cholesterine; (2) obstruction to the flow of bile into the duodenum, in which case the matters generated in the liver itself (bile acids) appear in the urine. The tests for bile are as follows:

1. A few drops of nitric acid added to the bile-stained urine, upon a white porcelain plate, produces an iridescent play of colors.
2. If one-half drachm of strong sulphuric acid, with a small fragment of loaf sugar, is added to about two drachms of bile-stained urine, suppression will be indicated by a mere browning of the
sugar, whereas obstruction will be shown by a scarlet or purple color at the junction of the two fluids, due to the bile acids becoming oxidized.

Albumin.- The presence of albumin in the urine constitutes albuminuria. The most frequent causes of this condition are cold, scarlatina, intemperance, diphtheria, pulmonary tuberculosis, articular rheumatism, typhoid fever, erysipelas, measles and pregnancy.

Albumin in the urine is a prominent diagnostic feature in Bright's disease, but there is much more to the disease described by Richard Bright, in 1827, than is indicated by the fact that albumin is found in the urine. As has been pointed out by Dr. A. B. Conklin, pathology reveals different types of nephritis, as the glomeruli or stroma are involved, while the functional and structural changes following may, in the early stages, be diametrically opposite.

"A single type of nephritis is not characteristic of so-called Bright's disease, nor does the nephritis of whatever type constitute the entire morbid process. The term Bright's disease, though palpably inadequate as heretofore applied, no longer expresses our conception of certain correlated processes, may still be used, by sufferance at least, for want of a more acceptable term, to cover the more than incidental association of nephritis with well-defined cardio-vascular changes and resultant cerebral lesions.

"While such changes as come to the heart and arteries are more commonly observed in the chronic than in the acute types of nephritis, the fact should not be lost sight of that it is only the structural changes occurring in these organs that, as a rule, are looked for, and these are the outgrowth of time, which acute cases do not permit. There is, however, in the acute cases the same element of increased blood pressure which marks the beginning of the primarily chronic cases and leads to the later structural changes with both the arteries and the heart.

"The cardiac symptoms found in Bright's disease are hypertrophy, with accent-uation of the aortic second sound, displacement of the apex impulse to the left, and later, dilatation with broken compensation, mitral systolic murmur from relative insufficiency, dyspnea, palpitation, gallop rhythm, dropsy and endo-or pericarditis, or both.

"The structural changes in the vessels are fibrosis, arterio-sclerosis, atheroma, aneurism, thrombosis, embolism, military aneurism, especially in the brain, degeneration of the coronary arteries with myocarditis, degeneration of the cerebral arteries with apoplexy, pulsation in the head, ringing in the ears, amaurosis or amblyopia from retinitis, with or without hemorrhage, epistaxis and hematemesis.

"These various forms of arterial degeneration are the logical sequence of long-continued high blood pressure, the pathognomonic sign of which is a short, sharp accentuated click upon closure of the aortic valve. The same factor of increased peripheral resistance throws more work upon the heart, the recognized result of which is compensatory hypertrophy.

"It being a well-recognized fact that chronic Bright's disease, in its varied types, acute and chronic, may exist, unrecognized by its nephritic symptoms, and since it is curable only in the stage of functional albuminuria, the importance of its early recognition is apparent." (Conklin).

The treatment of the conditions known as Bright's disease suggested by Dr. Conklin is in part as follows:

"The one cardinal etiological factor, and constant symptom in the beginning of all cases, is high blood pressure. This I have attempted to show is, in a large majority of cases, of aortic origin.

The improved treatment for toxemia is by elimination. The good we are able to do our patient in incipient Bright's disease is to institute a manner of living, including eating and drinking, that is conducive to a minimum formation of nitrogenous waste products within the body, and by judiciously applied exercise, baths, increased intake of fluids to flush the emunctories, and by suitable medication assist in the elimination of the toxic products already circulating in the blood.

"When we have done this we have removed the main cause of chronic Bright's disease. The cause being removed, the further possibilities of medication are limited to the relief of such results of this cause as still remain. Elimination should be accompanied by the use of suitable vasodilators. Amyl nitrite and nitro-glycerine are too fleeting in effect to be of the highest service except in a threatening emergency. Nitrite of sodium, veratum viride, theobromine or diuretin are much to be preferred for continuous use in chronic cases. When a cardiac tonic is required in the advanced stages, caffeine or strophanthus are much to be preferred to the conventional use of digitalis, which should be relegated to its proper sphere, which is, as in hypertrophy without nephritis, the late stage of broken compensation.

Uremic poisoning, however manifested, is to be met by the most prompt and vigorous elimination.
"The toxins accountable for high blood pressure are such as are normally eliminated by the kidneys, and a greater measure of success will attend our efforts to promote their elimination through these natural channels. The alkaline eliminants, sodium, potassium and lithium salts, are accepted as our best renal eliminants.

"Caffeine insures free diuresis without irritating the kidney as the more stimulating diuretics do, and without contracting the arterioles as does digitalis.

"The strenuous life should give way to one of moderation, and the diet should consist largely of fruits, vegetables and cereals, including milk and eggs. Have no fear that the patient cannot be properly nourished on a meat-free diet. There is more to be feared from meat poisoning than from lack of nutrition."

In making an examination of the urine the reaction and specific gravity must be ascertained. The reaction is determined by the use of litmus paper, which comes in two colors, red and blue. This paper is also known as test paper. In applying the test, we take a strip of the red paper and dip one end of it into the urine. The moistened paper will be colored blue if the urine is alkaline in reaction. If no change is noticed in the color of the dampened paper, we use a strip of blue in the same manner, and if the urine is acid, the dampened part will be changed to red. If no change in color is effected in either instance, the urine is neutral.

If possible the urine should be examined soon after it is voided, before decomposition sets in. The specimen of urine submitted for examination should preferably be taken from the whole amount passed in the twenty-four hours, collected in a vessel perfectly clean. Urine may be alkaline when first voided, and it is important that it be ascertained whether the alkalinity is due to the presence of a fixed alkali or to a volatile alkali.

This may be determined as follows: The litmus paper that has been turned to blue by the urine is exposed to the air until it becomes dry. If the blue color then remains the change was due to a fixed alkali; if not, to a volatile alkali.

The former reaction is of no special significance (it may be due to an alkaline remedy which is being taken), while the latter nearly always indicates cystic trouble.

"In testing for albumin in the urine the following procedure is sure to secure a clean test tube and a clear specimen of urine: Take an ordinary cotton tampon on a string, such as is used in gynecological work, push it to the bottom of the test-tube with a stick or glass rod, and pack it firmly. Then pour the urine into the test-tube and pull out the tampon very slowly by the string. This, on account of the atmospheric pressure, causes the urine to pass through the tampon and remain in the tube.

The tampon carries out with it any particles that can be removed by filtration, and at the same time cleans the inside of the test-tube. If there are several specimens to be filtered, the tampon can be rinsed under the faucet, or otherwise, and used over again. By this method test-tubes can always be kept clean and bright inside, and there is none of the delay occasioned in using filter paper. The process can be repeated quickly two or three times if the first filtration is not satisfactory. In detecting very small traces of albumin, a perfectly clean test-tube is of great importance," (Bishop.)

The following has received the approval of many experienced physicians:

"The urine should always be filtered through a high grade of filter paper,' and through several thicknesses if necessary, before applying any of the tests for albumin. To some this may seem trivial matter, but I consider it one of the most important steps in conducting a careful and reliable albumin test. All urines contain suspended matter, sometimes in large but often in small amounts, which must be removed in order to detect small traces of albumin.

"The urine should not be filtered through French chalk (talc), Fuller's earth, bismuth subnitrate, magnesium carbonate, char coal, or other inert substances. We are indebted to Dr. Brandreth Symonds for his investigation of the filtration of urine through French chalk. He found that albumin was removed from the urine by this substance. A good filter paper will clarify all urines except those containing chyle and many bacteria. A specimen containing bacteria can be clarified by precipitating the earthy phosphates with ammonium hydroxide and filtering; the precipitate of phosphates carries with it the bacteria. The urine thus treated is, after filtration, rendered faintly acid with 10 percent nitric acid, and it is then ready for the albumin tests. A urine containing chyle can be clarified only by shaking with ether." (Ogden.)

The specific gravity of urine is ascertained by means of the urinometer. In using this instrument for the purpose of determining the specific gravity of the urine there is a series of details which, if not carefully adhered to, may be the means of serious error.

In the first place, make sure that your float and cylinder are properly made—a poor apparatus is worse than useless. The float may be tested by placing it in distilled water at a temperature stated on
the float—if it does not state this, throw it away and secure one that does. If it is properly made, it will float at 1,000 under these conditions.

The cylinder should not be too small in diameter, else the float will impinge on its sides and thereby cause it to become fixed at a point either above or below the correct reading. An excellent cylinder is one with flutings in its sides which present nothing more than points to the float. A urinometer constructed on proper principles is made by Squibb. This may be obtained with or without a thermometer.

This last article is a necessary adjunct when it is understood that the specific gravity of a fluid varies with its temperature, one degree of specific gravity for every seven degrees of temperature. At higher temperatures the fluid is greater in bulk, and therefore the float will sink lower; or at colder temperatures it is smaller in bulk and the float rises.

For example, should the float be intended to read at 67° F. and the urine tested is at 88° F. the reading would vary three degrees too low, and therefore three degrees should be added. The rule is to add one degree specific gravity for every seven degrees of temperature, when the temperature exceeds that stated on the float, and to subtract one degree specific gravity for every seven degrees below. It is perhaps unnecessary to add that the float should be kept perfectly clean.

Finally determine whether the float is intended to be read from the top or the bottom of the meniscus. They vary in this respect, but are usually intended to be read from the top. In either event there is usually a variation of two degrees in the readings from the top and the bottom.

The following are among the most reliable tests for albumin in the urine:

1. Heat and nitric acid will independently coagulate or throw down albumin, but these reagents should be added together, since either, separately, may give a fallacious result. Phosphates, when in excess, are thrown down by heat, but dissolved by nitric acid, and nitric acid may cause a turbidity in urine containing an essential oil, as copaiba or cubebs. This oil may be separated by ether, and the urine will then have its usual reaction.

2. Place some urine in a test-tube, incline it gently, and allow a little nitric acid to trickle to the bottom slowly. Three strata will appear if the fluid is albuminous: at the bottom, colorless nitric acid; above this, coagulated albumin; at the top, unaltered urine.

3. Some nitric acid may be placed at the bottom of a test-tube, and the urine dropped on the top; at the line of junction of the fluids a white line of albumin will appear.

4. Picric acid in powder precipitates albumin, a reaction not interfered with by the presence of phosphates or urates. The test is so very delicate that it will detect a minute trace of albumin, unrecognizable by the nitric acid or heat method. It should be remembered that if the urine is alkaline, heat will not affect the albumin until a drop or two of acetic acid is added; or the presence of a drop or two of nitric acid in the tube may redissolve the albumin upon the subsequent addition of nitric acid.

5. Boiling is a reliable test for albumin. Fill a test-tube about one-third full of urine; if neutral or alkaline, add one or two drops of acetic or nitric acid. Hold the tube slanting, that the heat may strike the upper portion of the urine, and bring it to a boiling point. If albumin or the phosphates be present, the upper portion becomes turbid, which is clearly shown against the clear urine in the bottom of the tube. Then add a few drops of nitric acid, which will thicken the turbidity if albumin be present, and clear it if it be absent.

For quantitative estimation of albumin nothing is more satisfactory for the practitioner than Esbach's albuminometer. This is a specially constructed test-tube, with graduations marked on its side ranging from 1 to 7, and above these are two lines, one midway marked U and another near the top, marked R.

The reagent is known as Esbach's fluid, the formula for which is as follows:

<table>
<thead>
<tr>
<th>Reagent</th>
<th>Grammes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Picric acid</td>
<td>10</td>
</tr>
<tr>
<td>Citric acid</td>
<td>20</td>
</tr>
<tr>
<td>Water</td>
<td>1000 c.c.</td>
</tr>
</tbody>
</table>

To apply the test, fill the tube with filtered urine to the line marked U and then with the solution to the line marked R. Close the tube with a rubber stopper, and after thoroughly mixing the contents, place it aside to stand for twenty-four hours, at the end of which time note is made of the level to which the precipitate rises. If to the line 1, it indicates one part of the albumin per 1,000 by weight or 1 gramme to the litre; if to the line 2, two parts per 1,000, and so on, up to seven, but if five parts or more are indicated, the test should be repeated, using urine diluted one-half with water and then multiplying the result by two.

Sugar.—When sugar is found in the urine the condition is known as diabetes mellitus, or glycosuria, since glucose or grape-sugar is the variety present in the urine. In diabetes mellitus the first symptom to attract attention is an almost constant desire to pass urine. A much larger quantity of urine
than normally is passed daily—the normal quantity being from thirty to fifty ounces; in some cases there may be as many pints as there are usually ounces. The specific gravity of the urine in this condition may be from 1025 to 1050.

The following are among the most approved tests for diabetic urine:

1. Fehling’s test contains sulphate of copper (900 grains), neutral tartrate of potassium (364 grains), solution of sodium hydroxide (4 ounces), water being added to make up exactly six ounces. One grain of sugar exactly decomposes 200 grains of this solution. This original formula has been found to be too concentrated to obtain a delicate reaction. A less concentrated solution is, therefore, generally employed. It is divided into two parts, A and B, and is kept in separate bottles, and in a dark place. Equal parts of the two solutions produce diluted Fehling’s solution.

Place equal parts of the two solutions, A and B, about one finger breadth of each, in a test tube and boil. If the Fehling’s solution remains clear on boiling, then add twenty to thirty drops of the suspected urine which is free from albumin. Do not boil after the addition of the urine. If much sugar is present, a yellow or red precipitate of suboxide of copper readily appears. In case the quantity of sugar in the urine is less than 1 per cent., the reduction will not appear until after several minutes, five to thirty.

If a reduction does not take place in thirty minutes it is advisable to let the test stand for from eighteen to twenty-four hours, since traces of sugar show evidence of a reduction of the copper only after several hours, when a small amount of the sub-oxide will be found in the bottom of the test-tube. Less time is required for the test if the urine is gently heated previously to its being added to the boiling Fehling’s solution. The non-appearance of a sub-oxide precipitate shows that the urine is free from all sugar. Fehling’s test, employed in this way, is one of the most delicate and reliable of tests.

2. Trommer’s test is employed as follows: To a drachm of urine in a test-tube add a few drops of a dilute sulphate of copper solution, and then add one drachm of liquor potassce; bring this to the boiling point, and, if sugar be present, the copper is reduced, forming the yellow or orange-red suboxide.

Urinary Calculi and Concretions.

Urinary concretions, when small and numerous, and which pass readily with the urine, constitute sand or gravel. When, however, they are too large to be evacuated by the urine, they constitute calculi. The chief chemical constituents of urinary calculi are the following: Uric acid and urates, cystin, oxalate of lime, carbonate of lime, phosphate and protein compounds.

With the foregoing are mixed very small quantities of earthy matters (silica, aluminum, etc.). Sometimes the urinary concretion consists entirely of one of these substances; at others, it is composed of several of them, and not un frequently the concretion is formed of separate layers of the different constituents.

In testing a sandy deposit, it should first be examined microscopically, then the particles should be cleared of impurities, as pus and blood, and washed with distilled water; large particles should be reduced to powder. In testing calculi, their occasional constitution in layers must be borne in mind. They should be broken to pieces, and some of the powder from each layer carefully analyzed.

The best mode of proceeding analytically, is to heat some of the powdered calculus over a spirit lamp on platinum foil. Then if (1) the powder is entirely consumed, or only a very small amount of residue is left, it may consist of uric acid, or urate of ammonia, cystin, protein bodies; or (2) the powder is incombustible, or leaves considerable residue after being exposed to red heat, it may consist of urates with a fixed base (sodium, lime, magnesia), oxalate of lime, carbonate of lime, phosphate of lime, or ammonio-magnesian-phosphate. If, when the powder is acted upon by nitric acid and ammonia, a distinct murexide reaction is obtained, the concretion is formed of urate of ammonia or uric acid, and these substances are thus distinguished: Uric acid is only slightly soluble in boiling water, whilst urate of ammonia is far more soluble, and in much larger quantities, and, upon the cooling of the solution, it is again precipitated, and with liquor potassae gives off ammonia.

The uric acid calculus is of quite frequent occurrence and is sometimes of considerable size. It is usually of a yellowish or reddish-brown color, with a smooth surface and rather haret. The urate of ammonia calculus is of rare occurrence. It is generally small, of a loamy lightish color, and more earthy in consistence than the preceding substance.

If there be no murexide reaction and the concretion is combustible, it may consist of one of the following:

The cystin calculus is rare. It is of a dull yellow color; the surface is smooth, and exhibits a glistening crystalline appearance when broken. It is softish, and when reduced to powder communicates a soapiness to the fingers. From the larger amount of sulphur contained in it, if this
calculus be dissolved in liquor potassae and a little acetate of lead be added, the solution being then boiled, the mixture becomes inky from the precipitation of the black sulphide of lead.

A calculus formed of protein substances (fibrin or blood coagula) is very rare. It is amorphous in appearance; upon burning, it gives off an odor of burnt horn, it swells up on the addition of acetic acid, and is soluble in boiling nitric acid.

Urates of sodium, lime and magnesia are very seldom found as the only constituents of a calculus, but they are occasionally met with in variable quantities in calculi consisting chiefly of other substances, viz., in the uric acid and urate of ammonia calculi.

The powdered calculus is boiled with distilled water, and the solution filtered while hot; if urates are present, they will be found in the filtrate. This is evaporated, the residue being heated to redness, and if it turn moistened turmeric paper brown, will indicate sodium or potassium. Sodium imparts a yellow, potassium a violet tinge to the blowpipe flame. Magnesia and lime will be found in the residue, as carbonates; these are freely soluble in diluted acids. Upon the addition of phosphate of ammonia and sodium to the solution, the ammonio-magnesian-phosphate and phosphate of lime are precipitated.

Oxalate of lime, when subjected to strong heat, turns black from the combustion of organic matter often present, but becomes white again after continued exposure to heat, being converted into caustic lime. If this last substance be dissolved in hydrochloric acid and oxalic acid added, oxalate of lime is precipitated, which may be recognized by its microscopic appearance.

The oxalate of lime calculus is frequently met with; it is either small, smooth, and pale in color, or larger, with a nodular, warty surface, and of a dark-brown or black color. (the mulberry calculus). It is common in children.

A calculus composed entirely of carbonate of lime is also rare. It is of a whitish-gray color and chalky appearance.

Carbonate of lime is generally found, in small quantity, as a component of other calculi blended with the earthy phosphates and oxalate of lime.

A concretion of carbonate of lime is infusible, and becomes black when burnt, on account of the organic matter which it often contains, but further heating renders it white. It also dissolves in hydrochloric acid with effervescence.

Basic phosphate of lime and ammonio-magnesian-phosphate are generally found together as constituents of urinary calculi. These calculi are usually whitish and often of considerable size. If phosphate of lime is in excess, they are hard and thick; but if the ammonio-magnesian-phosphate predominates, they are chalky and soft. They are incombustible, and have been termed fusible calculi, since they fuse to a white enamel-like mass after exposure to strong heat; they are soluble in hydrochloric acid without effervescence.

These two constituents are separated by adding to the calcined powder diluted hydrochloric acid, and filtering the solution; then adding ammonia and oxalate of ammonia, by which the lime is precipitated as an oxalate. After filtration, the phosphate of ammonia and magnesia may be obtained by the addition of ammonia in excess. Calculi of neutral phosphate of lime are very rare; they resemble the earthy phosphates.

The composition of urinary calculi is sometimes very complicated. Thus, some consist of uric acid, urates and earthy phosphates; others of oxalate of lime and earthy phosphates; and, again, others have been met with composed of six constituents, namely, uric acid, oxalate of lime, urate of ammonia, phosphate of lime and ammonio-magnesian-phosphate. These may be all mixed together or disposed in concentric layers.

Every calculus usually possesses a nucleus which is formed by foreign bodies, such as blood coagula, mucus and fibrin, or by sand particles, but sometimes there may be a cavity instead of a nucleus, the mucus having dried up by which the nucleus was originally formed.

False or spurious calculi usually contain much silica, which will be detected by fusion with carbonate of sodium or potassium.

Urinary Tube Casts.

The generally recognized urinary tube casts are six in number. They are as follows:

1. Granular casts are dark and granular in appearance. They are about 1-700 of an inch in diameter, and are composed of fibrin and disintegrated epithelium; they are indicative of chronic nephritis, especially the inter-tubular variety, and usually occur in the urine after frequent attacks of gout. They may be found long before any other sign of renal trouble has been observed.

2. Waxy or transparent hyaline casts are quite structureless, clear glassy cylinders, and vary in
diameter from 1-3000 to 1-300 of an inch.

They are sometimes found in the advanced stages of chronic nephritis, but also occur in acute forms of kidney disease.

3. Oily casts consist of fibrin, in which are entangled oil globules and epithelial cells gorged with oil. They indicate fatty degeneration of the kidney.

4. Purulent casts exhibit pus-cells entangled in casts of fibrin, and occur in suppurative nephritis.

5. In blood or exudative casts the blood is moulded in the renal tubes. They are observed in cases of strangury and hematuria and acute diseases of the kidney.

6. Cellular or epithelial casts are covered by the epithelial cells of the tubuli uriniferi. They indicate that the disease is recent, and that the tubes are as yet lined by epithelium.

CHAPTER XV.

PHYSICAL DIAGNOSIS.

DISEASES of the respiratory organs and the heart are diagnosed in part by an exploration of the chest with the ear. Whilst an examination of the chest with the eye and touch will determine something of the character of the disease, and direct our attention to remedies, our reliance will be placed principally upon what we hear.

In the case of the respiratory organs, a very important part is to determine the capacity of the lung for air, or the amount of air contained in the chest, and this is accomplished by percussion.

The walls of the chest are thin and elastic, whilst the lung which fills it contains normally four or five times as much air as there is of solid substance. Any elastic body containing air will give resonance when struck, and the resonance will be in proportion to the amount of air. Lessen the amount of air, replacing it with a solid or fluid, and dullness of sound is the result.

The object of percussion, then, in diseases of the respiratory organs is to determine the condition of the parenchyma of the lungs with reference to capacity for air. By examination of the healthy thorax we obtain a standard of normal resonance for different parts of the chest, and this we use as a basis for comparison. In many cases, but one side of the thorax being involved in disease, a comparison is instituted between the sound and the diseased side. In such cases, of course, the information is more accurate, as we have the normal standard of resonance before us.

Percussion is either direct or mediate, as we strike directly upon the wall of the chest, or interpose something between. Direct percussion may sometimes be employed with advantage, using one or two fingers to give the blow. The only objection to this method is the unpleasantness to the patient, and the difficulty of making percussion of the intercostal spaces. In mediate percussion an ivory or rubber plate (pleximeter) is sometimes employed, using the finger for the stroke, or a small mallet of similar materials. The best method, however, is to apply one or two fingers accurately to the wall of the chest, and use the middle finger, supported by the ring finger and thumb, to give the stroke.

It is necessary to use care in this, the fingers of the one hand being accurately applied to the chest, and the stroke being at right angles, and the muscles of the hand held firmly so as to give a quick rebound.

As the object to be determined is the capacity of the lung for air, we make percussion both during full inspiration and after expiration. In examining the margin of the lungs with reference to capacity for air. In examining the margin of the lungs over the false ribs and the sternum, it is necessary to have the patient take a full inspiration to carry the lung down to the insertion of the diaphragm in the one case, and to the mesial line in the other. In making percussion over muscles it is well to put the body in such position that the muscles will be rendered tense. In examinations about the shoulder, it is raised to allow our examinations to be carried up in the axillary space, or thrown forward or backward, to enable us to reach the upper part of the chest.

In making comparison between the two sides, we are careful that there is the same degree of inflation, and it is better to have the patient take a full breath, and hold it as long as he can conveniently, or cease respiration for a moment, after the air is thrown out.

Normal resonance tells us that the parenchyma of the lung is free from effusion, it may be the seat of irritation, but the capacity for air is not interfered with.

Increased resonance in slight degree is heard when the function of one lung being impaired, the other does an increased work. In greater degree it is evidence of emphysema. When very marked and over a limited portion it is the evidence of a cavity.

Dullness on percussion evidences that the air is replaced by a solid or fluid; as is the degree of dullness, so is this change in the physical condition of the lung.

We have dullness in acute pneumonia commencing about the third day, sometimes earlier, and increasing as deposit takes place in the air cells and intercellular passages and in the connective tissue-
as is the dullness, so is the intensity of the disease. Resonance returns when the circulation is restored and effused materials are absorbed. Dullness is also an evidence of chronic inflammation of the lungs, being usually much more extensive than in phthisis pulmonalis, for which it might be mistaken. Dullness on percussion is heard in phthisis when the tubercle is deposited in considerable quantity and near the surface. In the earlier stages the dullness is so slight that it is not an important evidence of disease.

We have dullness on percussion where there is fluid in the pleural cavities, whether it is simply of water or the products of inflammation. In this case the dullness is of the most dependent part, and unless it is an extreme case, changing the position of the patient will change the situation of the dullness.

We have dullness on percussion in phthisis when the tubercle is deposited in considerable quantity and near the surface. In the earlier stages the dullness is so slight that it is not an important evidence of disease.

We have dullness on percussion in hydropericardium and, to a limited extent in hypertrophy of the heart. The situation of the dullness and the change in the sounds of the heart will determine the condition of disease.

Occasionally we have dullness on percussion from the formation of thoracic aneurism and still more rarely from growths in the cavity of the chest. Other symptoms will determine the character of the wrong.

The reader will notice that in an acute disease dullness on percussion has reference mostly to effusion into and solidification of the parenchyma of the lung. The extent of the dullness determines the amount of tissue involved, and its intensity determines, to some extent, the severity of the lesion. In so far as it suggests treatment, it would say—lessen irritation and determination of blood to the lungs—give the respiratory apparatus rest by appropriate food, and in so far as medicines act to sustain the life of the part, and of the body at large—and by the establishment of secretion promote the absorption of effused material.

Percussion is sometimes employed in other parts than the thorax to give evidence of disease. Thus we find that some wrongs of the stomach, of the liver, spleen, bowels and reproductive apparatus, give rise to changes in the sounds heard on percussion.

Disease of the stomach with generation of gas will be evidenced by marked resonance on percussion over the stomach. In some cases of chronic disease this condition is persistent, and the continually distended stomach is pressed upwards until it occupies considerable space, and resonance might lead us to suppose that a cavity had formed in the inferior lobe of the lung, had we not symptoms of gastric lesion and the resonance extending across the epigastrium.

On the right side an enlarged liver presses upwards, encroaches upon the cavity of the chest, and gives marked dullness on percussion over the right false ribs. The evidences of wrong digestion and the fullness at the margin of the ribs will correct the diagnosis.

In distension of the bowels by gas we get evidence of resonance on percussion. If of the small intestine it occupies the anterior part of the abdomen; if of the large intestine, it is lateral or in the situation of the transverse colon.

In ascites the small intestine distended with gas floats at the top, and though we get the dullness of water below, and succussion on palpation, there is resonance at the highest part if the convolutions are free to move.

In ovarian dropsy, on the contrary, the sac displaces the small intestine as it grows, and either crowds it upward or backward. Intestinal resonance on the surface, in dropsy, is therefore one of the differential points in distinguishing between ovarian disease and ascites.

We employ palpation to determine the presence of fluid, whether in the cavities or formed by the breaking down of tissue. In some cases the evidence of fluctuation is very distinct, the wave of fluid passing distinctly from the one hand on the one side to the hand on the other. In other cases we obtain only a sense of mobility and the elasticity of fluid.

When parts give rise to sound in the performance of their functions the character of this becomes evidence of disease. This is the case with the respiratory apparatus, the heart, and, to a less extent, with some other parts.

Listening to sounds thus produced is called auscultation, and, as practiced, may be either direct or mediate. In direct auscultation the ear is applied to the part and the sounds heard. In mediate auscultation the stethoscope is employed as a conductor of sound. Some physicians prefer direct auscultation, but the stethoscope is most frequently employed.

In the practice of auscultation, whether direct or with a stethoscope, the physician is careful to avoid adventitious sounds, and to place his body in a convenient position for listening. The rubbing of clothing, either upon itself or against a stethoscope, will frequently mask the sounds we wish to hear. A constrained position of the body frequently interferes with listening.
In auscultation of the chest in health two respiratory sounds are heard—the respiratory murmur and the bronchial sound. The first is heard during inspiration and expiration over the entire surface of the lung; the second is heard by applying the ear over the spinal column from the middle cervical region to the sixth dorsal vertebra—the spinal column being a good conductor of sound. If the normal respiratory murmur is heard we know this portion of the parenchyma of the lung is healthy; if it is changed in character, or replaced by adventitious sounds from the air cells and small passages, we know that there is disease.

We may say first that a wrong sound made in the respiratory apparatus is evidence of disease of this apparatus. We want then to determine the value of the sound and the distinct lesion that produces it.

To this end, the first question is as regards the medium for the conduction of sound. Solids conduct sounds best, fluids next best. Air stands next as a conductor, and mixed bodies last. The lung, with its spongy tissue filled with air, is a bad conductor of sound. If it is solidified it becomes a good conductor and sounds will be heard which otherwise would not reach the ear. Fluids compressing the lung are also good conductors of sound. To determine this point, then, percussion is made—if there is resonance the sound is referred wholly to a wrong of the part where it is produced; if there is dullness on percussion it is referred in considerable part to the consolidation of lung or to the effusion, which gives a better conductor of sound.

Morbid sounds may be divided first into blowing and crepitant, having reference to the parts in which they are produced. Blowing sounds are produced in bronchial tubes and crepitant sounds in the intercellular passages and air cells.

Blowing sounds are blowing. The idea the listener gets is of air blown through a tube possessing some elasticity. In the blowing sounds heard in diseases of the respiratory apparatus, the listener gets an idea of obstruction; the air does not pass as freely as in health. In one case the sense is of constriction—evidently the caliber of the tube has been diminished—the sound has the higher tone or shrillness that would be thus produced. In another case the obstruction is evidently within the tube, either from fullness of mucous membrane or from increased secretion, and the sounds are lower in tone—duller—or show the evidence of mucus in more or less of gurgling. In a third class of cases the obstruction is evidently from want of elasticity and tone in the tube, which yields before the passage of air, both in inspiration and expiration—the waveriing tone of the sound determines this condition.

In so far, then, as we have analyzed the simple character blowing, we have suggested to us a rational practice of medicine. Contraction of the bronchial tubes is in the majority of cases from irritation—employ those remedies which take away the irritation. Fullness of mucous membrane suggests the employment of means to relieve determination of blood and to promote absorption.

Increased secretion suggests the employment of means to take away irritation and determination of blood and check secretion, whilst the wavering sound, indicating atony, calls for stimulants, tonics and restoratives.

Blowing sounds are dry and moist, and these common words express clearly the idea formed upon hearing the sounds. They are dry and moist, as they refer to a condition of dryness or moisture of the mucous lining of the bronchial tubes.

Dry blowing sounds evidence a condition of bronchial tubes in which there is an impediment to the free passage of air, and more or less arrest of the normal mucous secretion. Dryness itself is an impediment to the passage of air, but in addition there is contraction of the bronchial tubes. We are in the habit of saying—as is the blowing, so is the impediment to the passage of air; as is the moisture, rattling, bubbling, gurgling, so is the amount of fluid in these passages. The ear readily determines from the character of the sound, whether the blowing is still due to contraction of the tubes,
for in this case the sound is steadier and more resonant than if caused by obstruction from accumulated fluids or from atony.

The well-sustained sonorous sound always means contraction-contraction results from irritation-use remedies to lessen or take the irritation away. The impediment from secretion of mucus, muco-pus or purulent fluid is clearly expressed in the sounds heard, and it is well to take the evidence of the ear rather than any technical classification of sound. The presence of just sufficient secretion to lubricate the passages, of occasional accumulations which need removal by expectoration, of continued accumulation, giving rise to rattling sounds like the bursting of large bubbles, or the gurgling which comes from large quantities of fluid, are distinct and unmistakable. The treatment is clear-take away the causes of determination of blood, whether due to irritation of the respiratory nerves or some general lesion. Give these tissues such support as we can by the use of remedies that give local or general stimulus and tone. And to a certain extent favor the removal of these accumulations by expectoration-usually by giving strength to the respiratory apparatus.

The evidence of atony of the respiratory passages is found in the yielding or tremulous character of the sound. Whilst the evidence of contraction was found in the well sustained sound, this is found in the feeble sustained sound. The treatment is clear - to sustain and increase the strength of the patient, and to stimulate and strengthen this enfeebled organism.

When cavities are formed in the lung communicating with the bronchial tube the ear detects a peculiar blowing sound, as of air blown into a bottle. This may be dull and more or less gurgling, showing that the process of removal is not yet completed, and the walls of the cavity are of the spongy, partly broken-down lung. Or it may be clear, well sustained and more or less resonant, showing the removal of deposit and cicatrization.

Small blowing sounds, varying in character, shrill, whistling, piping, irregular, tortuous, dry, moist, rattling, all combined, in varying proportions, are the best evidences of phthisis pulmonalis. If the reader will think for a moment of the structures involved, the situation of the tubercular 'deposits, how they must press upon the smaller bronchial tubes, changing their position, making them tortuous, changing their caliber, he will see at once that these are just such sounds as might be expected.

In addition to these small, queer, blowing sounds, the ear detects that known as dry crackling. During a full inspiration three or four distinct crackling sounds are heard, which seem to the ear very much like the sounds produced by separating two surfaces attached by a glutinous fluid. And undoubtedly this is the condition, for if the tubercle is so deposited as by pressure against a bronchial tube to efface its cavity, the separation of the glutinous walls of mucous membrane would give just such sound.

Crepitant sounds take the place of the respiratory murmur, and are formed in the air cells, the intercellular passages, and the minute bronchial tubes. When, therefore, small crepitation is heard, we refer it at once to disease of the parenchyma of the lung. If we inquire into the condition of the lung-the changes of structure that will produce such sound-we find it in irritation, determination of blood, and slight effusion into these minute air passages. If the effusion goes on, the lung is rendered impermeable to air and the crepitant sound ceases.

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Crepitation is therefore the evidence of inflammation of the lung in its first stage, and is associated with resonance on percussion, for the disease has not progressed to hepatization. Where effusion has taken place to the extent of giving dullness on percussion, the crepitant sounds are replaced by blowing sounds from the bronchial tubes, the lung being now a better conductor of sound. Larger crepitance refers us to the minute bronchial tubes, and is the evidence of capillary bronchitis. The smaller crepitance is not only heard in the first stage of the inflammation of the lungs, but returns with the absorption of the effused material and resolution, and is, therefore, the evidence of the subsidence of the disease.

As crepitance is the evidence of the active stage of an inflammation, in which irritation and determination of blood are the prominent factors, the treatment is plain. In so far as we can take away the irritation and stop the determination of blood, our treatment will be rational. The frequent pulse, the high temperature, and the rapid respiration, are important elements in the furtherance of the local disease, and means that will rectify these wrongs are of first importance. As the succeeding stage is one of local depression of life, no means should be employed that will depress either the life in general or of the affected part.

There solidification of a lung has taken place it becomes a better conductor of sound, and if now the ear is applied and the patient is engaged in conversation, the voice seems to come out through the chest. We do not get articulate speech, but simply the modulations of the voice. This is called bronchophony (speaking through the bronchial tubes), but its only value is to determine solidification of the lung, and percussion is the better evidence.
If there is fluid in the chest, and the ear is applied over it, the patient conversing, the voice seems to come out through the chest, but has a tremulous tone. This has been called egophony, and is one of the evidences of fluid in the pleural cavities.

If the ear is applied over a cavity, which is free and communicates with a bronchial tube, and the patient is engaged in conversation, the articulate voice comes to our ear through the chest. This is called pectoriloquy, and is additional evidence of the formation of a cavity in the lungs.

In some cases of structural disease of the pleura, the result of inflammation, certain friction sounds are heard, but they are not very common, distinct or definite. Once in a while they are said to assume the distinctness of the "creaking of new leather." We employ auscultation in the examination of the heart with as much advantage as in diseases of the respiratory apparatus.

As the sounds produced by the heart are much louder, and more distinct and arbitrary, many persons will succeed better in auscultation of the heart than of the lungs.

The normal sounds of the heart are smooth, uniform in tone, regular in time, and give the ear an agreeable sensation. No description in words would give the reader a sufficient knowledge of them; they must be heard to be thoroughly known.

If in examination of the heart, we find that the sounds are normal, we are quite sure that there is not structural disease of this organ. If there are general symptoms of heart disease, the wrong is functional. If, on the contrary, the heart sounds are changed, or replaced by adventitious sounds, we are just as sure that there is structural disease of the organ.

The two exceptions to these rules are: (1) In case of anemia or spanemia we hear blowing sounds, which are referred to the wrong in the blood, and not to the heart; and (2), in fatty degeneration, no change in the sounds of the heart announces the structural lesion.

The morbid sounds of the heart may be divided into blowing and sawing, and the ideas conveyed by these words represent exactly the character of the sound. Whilst blowing sounds may be referred sometimes to lesions of the walls of the heart, and a wrong in muscular contraction, the sawing sounds are referred to the openings of the heart, and to the valves, and usually to lesions that obstruct the free flow of blood.

The blowing sounds have been named bellows murmurs, and have every range between the simple, smooth, blowing sound, similar to that heard from the bronchial tubes, to the roughened, irregular, rattling sound, similar to that produced by a pair of bellows in motion. If the sound is dependent upon poor blood, it may many times be heard over the large arteries as well as the heart, and in this case will call for the proper restoratives and food to make good blood. If dependent upon enfeebled nutrition, or degeneration of the walls of the heart, we employ means to give the heart rest, see that it is not subject to excitement, and employ means to improve nutrition. The rough, irregular sound that is attributed to valvular insufficiency and regurgitation would demand the same treatment.

The saw sound has been divided into three varieties, the saw, rasp and file sounds, but the distinction has but little reference to conditions of disease or to the use of remedies. Possibly the finer sounds may refer to a more acute condition of the ease, in which plastic material is yet being deposited. In some cases of valvular insufficiency we hear a marked saw sound, but it has an irregularity and dullness that we do not meet with in the other cases.

The more common lesions that give rise to contraction of the openings of the heart, and such diseases of the valves as prevent their free movement, are inflammatory, and give fibrinous exudation as the result. The most of these are rheumatic in character, involving the tendinous portions of the muscle and the endocardium. There are rare cases in which the sounds are due to fibrinous vegetations from the valves or to ossific deposit in their structure.

The treatment suggested by these sounds has reference, first, to rest, and secondly, to means which will promote absorption and give us a better renewal of life. Rest is absolutely essential to recovery from chronic inflammation and the absorption of its products. We want physical rest and mental rest, and such relief from irritation of the cardiac nerves as may be obtained from the use of cactus, cretegus, pulsatilla and the special sedatives. Removal of the deposits is facilitated by the establishment of free secretion, and a better heart is made by means to obtain good blood and good nutrition.

To determine pregnancy after the fifth month, the stethoscope is applied over the lower abdomen to hear the beating of the fetal heart. If it is heard the diagnosis is clear, but if not, we are not yet certain that pregnancy does not exist, for in many cases, from feebleness of the movement of the fetal heart, excess of liquor amnii, thick abdominal walls, or the position of the child, it cannot be heard until late in pregnancy, or not at all.

The greater part of the remainder of this chapter is taken in substance from a work by Dr. J. C.
Thorowgood, an eminent English diagnostician. For the purposes of examination of the pharynx and larynx the patient must be placed opposite a good light, and when he has opened his mouth the tongue should be gently drawn forwards and downwards, rather than merely depressed by a spatula, so that thus it may be out of the line of vision. The parts to be first examined are the pillars and arches of the soft palate.

Normally often redder than the surrounding mucous membrane, these structures should appear free from any trace of catarrh, and the arches on each side of the uvula should be well-formed and symmetrical. The uvula should not be swollen or unduly pendulous, and the tonsils, if healthy, scarcely visible. When the patient inspires deeply through the throat, the posterior surface of the pharynx comes well into view, and should not be rough or granular-looking, nor should it exhibit any sign of venous congestion, increased secretion or ulceration.

The small nodules that are seen are caused by the presence of small follicular glands, and the whole mucous membrane is covered with pavement epithelium.

A translucent appearance about the edge of the uvula and palatine arches indicates edema of the parts; and much catarrhal mucus indicates cold caught or an unhealthy state of the digestive organs. Under either of these conditions the voice will be thick, husky and nasal.

The larynx is examined by means of the laryngoscope. In the best forms of the laryngoscope, a mirror, fixed to a spectacle-frame by means of a ball-and-socket joint, is placed before the eye of the observer, opposite to whom sits the patient with his head thrown slightly back and his mouth open. A lamp is placed on a level with the patient's left eye, from which the light, falling on the reflecting mirror, is projected into the throat, and so illumines the small laryngeal mirror which is held by the physician just over the larynx, and in which, therefore, the laryngeal image is readily seen by him as he looks through the small aperture in the center of his reflecting mirror.

As soon as a ray of light is clearly thrown from the reflector onto the uvula of the patient, the observer must take the warmed laryngeal mirror in his hand as he would a pen, and pass it over the dorsum of the tongue, which organ must be drawn well forward by the free hand grasping its tip with a soft napkin.

He should then pass the mirror backward until it reaches the uvula, care being taken not to touch the surface of the tongue, as retching would then be the result.

The laryngeal mirror being thus in position, with its metallic surface gently pressing the uvula upwards and backwards, the patient must be directed to say "eh" or "ah," and the image of the larynx will then be seen reflected in the mirror. A little movement of the mirror to right or left, up or down, will bring all the parts of the larynx under inspection. First will be seen the back of the tongue and its papillae; then, at the top of the mirror, comes into view the epiglottis and the glosso-epiglottidean ligaments. From each side of the epiglottis extend the aryepiglottidean folds, containing the small prominences known as the cartilages of Wristerg and of Santorini. These last cartilages surmount the arytenoid cartilages, and are seen at the bottom of the mirror. Between the aryteno-epiglottidean folds and the true vocal cords is seen the red mucous surface of the ventricular bands, or false vocal cords, containing in their free edge the thyro-arytenoid ligaments. Between these ventricular bands appears as a dark line on either side the ventricle of the larynx; by turning the mirror so as to get a lateral reflection, the space of the ventricle is better discerned. Below these parts are seen the true vocal cords shining like mother-of-pearl, and moving to and fro in the acts of phonation and respiration. Beneath the cords can sometimes be seen the rings of the trachea, and, rarely, the opening of the right bronchus.

The true vocal cords constitute the limit of the greater part of the rima glottidis.

Posteriorly they are continuous with the vocal process of each arytenoid cartilage, so that the anterior part of the chink of the glottis is ligamentous, and the posterior part or base of the lozenge-shaped chink is cartilaginous. The vocal cords are covered with pavement epithelium, the rest of the laryngeal epithelium being ciliated.

It should always be remembered that the parts of the larynx seen to the right and left in the mirror correspond with the patient's right and left; thus there need be no confusion in describing the appearance of the parts as seen by the observer.

The opening of the glottis is bounded laterally by the arytenoid cartilages and vocal cords; its apex is the thyroid angle or anterior commissure of the vocal cords. This aperture dilates in inspiration, and contracts in expiration and phonation. To see it dilate, the patient must be directed to inspire deeply, and then the posterior and anterior walls of the larynx are well opened to view. The arytenoid cartilages, surmounted by the cartilages of Santorini, will be observed widely to separate, and thus to display the rings of the trachea.

Sometimes the ventricular bands or false vocal cords approach so near the median line as to
hide the true vocal cords from view. In such a case a deep inspiration will cause a full separation of the ventricular bands, and then the white true cords are seen below the ventricles of the larynx.

The color of the epiglottis is like that of the inner surface of the eyelids; in shape and size this cartilage varies much. An inflamed and catarrhal condition of the larynx is known by the epiglottis, on its posterior surface especially, being tumid and very red. The arytenoid cartilages also may be of a deep red color, and swelled to the size of small beans. The superior or false vocal cords may be affected by catarrhal inflammation, and, losing their natural pale red hue, they become deeper in color, and by swelling encroach on the ventricles of the larynx, so as to obscure the true cords. When these last-named structures are inflamed they lose their white color and become injected with an irregular red mottling. If the inflammation is severe, the margin of the true cords is rounded from edema, and respiration obviously much impeded. In these catarrhal conditions of the larynx, strings of viscid mucus are often seen extending across the laryngeal aperture.

In narrowing of the laryngeal aperture inspiration is observed to be slow and prolonged, and may be accompanied by a crowing sound, or stridor, as is observed in the case of children when the rima glottidis is constricted by croupous inflammation. Should it be observed that the patient cannot form a properly sounding cough or sneeze, attention should be directed to the way in which the vocal cords come together, for the probability is that one of them (usually the left) will be observed to be motionless when an attempt at phonation is made. This indicates paralysis of the adductor muscles of the vocal cord, and may be due to a tumor within the thorax pressing on the motor nerves of the larynx. After a while the arytenoid cartilage and vocal cord on the paralyzed side becomes shrunk and wasted by atrophy.

When the mucous membrane of the larynx is seen to be thickened and covered with irregular prominences, it is probably the early stage of laryngeal phthisis, and before long ulcers will form on the cords and on the posterior surface and cushion of the epiglottis. These ulcers are irregular, with "nibbled" look at the edges, covered often with purulent secretion, and, once formed, scarcely ever get well.

The syphilitic ulcer of the larynx usually attacks the cords and the surface of the epiglottis; it is slow in development, and very often circular, with sharply defined edges. The ulcers can be healed under a proper course of anti-syphilitic treatment; but if neglected, they spread and cause destruction of the epiglottis and of the other laryngeal structures in a most serious way; hence the great importance of early recognition and treatment.

Morbid growths in the larynx often interfere very seriously with the act of speaking; they are nearly always found attached to the "Vocal cords. Cancer, when it attacks the larynx, spreads usually to this organ from some contiguous part. Edema of the larynx or glottis may be a result of inflammation, or it may be part of a general state of dropsy or anasarca.

The parts are tumid, and respiration much obstructed. Examination by the laryngoscope under these conditions is often impracticable, and the diagnosis is made by observing the aphonia, the harsh, barking cough, and the difficult, hissing respiration. The finger passed deeply into the throat will detect the swelling about the epiglottis and the rima glottidis.

The naso-pharynx and nasal passages may be inspected by means of a laryngeal mirror fixed on a slightly curved shank, and turned upwards just in the opposite direction to that employed in laryngoscopy. Rhinoscopy is a more difficult process than laryngo-scopy. Where a pendulous tumor or nasal polypus occupies the posterior nares and extends down behind the soft palate, its relations are best made out by means of the finger passed deeply behind the soft palate. Further knowledge may be acquired by dilating the anterior nares by a trivalve nasal speculum, and seeing how much of the tumor can be thus brought into view.

In examining the thorax by inspection, the chest must be uncovered, and the patient made to sit, lie, or stand in a good light. Note should then be taken of the movements of elevation and expansion as the breath is drawn, and these movements viewed anteriorly, laterally, posteriorly, and from above downwards, the observer standing above and looking down at the movements of the chest of the patient sitting below.

Note should be taken of any enlargement of the cutaneous veins, for this may indicate obstruction to the circulation beneath, and attention should be paid to any irregularity or thickening about the ribs or their cartilages. Lateral flattening of the ribs, and consequent diminution in the lateral diameter of the thorax with protrusion of the sternum, is observed in children afflicted with rickets.
There is also seen a groove on either side of the sternum, extending from the first to the ninth ribs along the line of junction of the ribs with their cartilages. This change is produced by the recession of the thoracic wall during inspiration. The groove extends farther down on the left than on the right side, in consequence of the support given by the liver to the thoracic wall on the right side. The chest of a rickety child is often covered with hairy down, and its forehead is square in form. Obstruction to the entry of air into the lungs by partial occlusion of the windpipe or of the bronchi by spasmodic asthma in the child, often leads to a retraction and falling in of the lower part of the thorax. Very great retraction and collapse of the lower ribs, and forcing forward of the sternum, like the keel of a boat, produce the "pectus carinifonne."

A well-formed thorax is symmetrical on its two sides, and from the line of the nipples slopes downward to the lower ribs. The nipple line corresponds about to the level of the fourth interspace. Under certain conditions the conformation of the thoracic parietes may be changed as a result of imperfect development, independent of any diseased action. In this way is produced the long, narrow chest with wide intercostal spaces, and sinking of the manubrium sterni so that it forms an angle at the point where it joins the body of the bone. This form of chest is usually associated with more or less delicacy of lung.

Pathological changes in the shape of the thorax may be arranged as follows:

1. General bilateral bulging and enlargement, with increase in all the diameters of the thorax. This condition constitutes the "barrel-shaped chest," and is observed in advanced large-lunged emphysema, resulting usually from long-standing bronchitis. It will be observed that in these emphysematous chests very little difference in circumference takes place in the movements of inspiration and expiration, the lungs being distended in a permanently inspiratory position.

2. Unilateral dilatation of the chest may be due to an excessive pleuritic effusion on that side. This great distension of one side of the chest indicates a large amount of fluid which has pressed the lung well back against the spine. Before such distension of the chest wall is observed, it will be noticed that the intercostal spaces are flattened, so that the external surface of the chest feels even and smooth to the applied hand. A large distension of one side of the chest will also cause displacements of the organs by pressure. Thus the heart is carried over to the right by fluid in the left chest, and liver or spleen may be pressed downward by a collection in the thoracic cavity above these organs.

3. Tumors within the chest may cause undue bulging of some part of the chest wall. A bulging of the lower part of the right chest may be caused by enlargement of the liver. Contraction of one side of the chest may be due to the absorption of an old pleuritic effusion. The lung having been long subjected to pressure from a collection of fluid, is so destroyed that it will not expand when this pressure is removed; hence the falling and contraction of the chest wall. In these cases the ribs are drawn so close as to overlap one another, the nipple is nearer to the sternum, and the shoulder-blade to the vertebral column on the affected side. The shoulder is drawn down, and the spine curved with its convexity towards the sound side of the chest.

The diaphragm and liver, on the right side, may be drawn up; and, on the left side, the heart may be drawn away from its normal position, even into the left axilla. These signs of a contracted chest after absorption or evacuation of fluid are often seen very well marked in the cases of growing children.

Circumscribed local depressions on the surface are due to shrinking of the subjacent lung, and may be caused by the contraction of a phthisical cavity, or condensation of lung tissue over a dilated bronchus. These local depressions should be looked for in the upper and anterior part of the chest wall.

In interstitial chronic pneumonia, cirrhosis of lung, or fibroid phthisis, the affected side, usually the right, is contracted, but the spine and shoulders are not altered, as they are in contraction of chest after pleurisy.

Tuberculosis and primary cancerous infiltration may also act as causes of retraction of the chest wall.
Mensuration of the chest is best effected by means of two tapes joined at the commencement of their scales and fixing them at this line of junction over the spine. The movement of each side of the chest in deep inspiration is thus readily ascertained. It should be remembered that in right-handed persons the right chest has always inspiratory excess of half an inch over the left. About thirty-three inches may be taken as the normal girth of a healthy chest.

To trace a gradual retraction of the chest wall, as in an absorbing pleurisy, a narrow strip of lead should be moulded to the contour of the chest, then carefully laid on a piece of paper and traced by a pen or pencil. Comparison at intervals of such tracings will show at what rate chest contraction is progressing.

The antero-posterior measurements of the chest are obtained by applying a pair of common steel calipers and observing the divergence of the blades. During inspiration a movement of expansion and elevation takes place in the thorax. In the first of these movements the sternum and anterior segment of the ribs pass forwards, the lateral outwards, and the posterior backwards. The intercostal spaces in ordinary calm breathing remain visibly hollow, the ribs diverging in forced inspiration and converging in expiration.

In the elevation movement of the chest the anterior and lateral walls are drawn upwards. During expiration the walls of the chest are restored to their previous condition by the movements of retraction and depression. The lungs, unless fixed by morbid local adhesions, follow every movement of the chest-wall. Supposing the time occupied by a respiratory act to be represented by 10, the value of the visible duration of inspiration would be represented by 5, that of expiration by 4, and the intervening pause by 1.

The abdominal movements of respiration differ much in the two sexes. The ordinary calm breathing of a man is effected mainly by the descent of the arch of the diaphragm, so that in counting the respirations of a male the hand should be applied over the epigastrium.

In the female, abdominal expansion is almost nil, and always posterior in time to the upper costal movement; hence, in counting the respiration of a female, the hand must be placed over the upper third of the chest.

The expansive movement of the chest can be roughly estimated by applying the palms of the hands under each clavicle while the patient inspires deeply. By practice the correspondence in expansion of the two sides can be very fairly judged by this method. To gain a more accurate knowledge, two pieces of measuring tape should be joined at the commencement of their scales, and the measurement made by placing this point of junction over the spine in the manner already described. In children, thoracic expansion is greater, and abdominal breathing less than in the adult.

Chest movement may be much changed by disease. In peritonitis and diaphragmatic pleurisy but little abdominal movement will be seen; and in intercostal neuralgia, pleurodynia, and the outset of pleurisy, movement will be notably diminished on the affected side. More or less tenderness on pressure will be found at the part where this limitation of thoracic movement is most marked.

Sometimes the respiratory movements exceed those of health. If the upper air-passages are obstructed by laryngeal swelling or stoppage, then the chest will actually retract during inspiration, while the abdomen enlarges from the descent of the diaphragm. In highly developed vesicular emphysema of the lungs, the lower intercostal spaces will be seen to fall in during inspiration. The cause of this is the rarefaction of the air within the lungs, and the consequent preponderance of the external over the internal atmospheric pressure. The retracted state of the lower intercostal spaces, and the forcing forward of the sternum, seen in cases of "pigeon breast," are conditions due to obstructed inspiration, dating usually from infancy, at a time when the thoracic walls are young and yielding, and so easily forced out of shape by unusual and irregular respiratory strain.

In some consumptive persons, with the upper part of the lungs disabled by disease, it will be seen that the lower lobes of the lungs act vigorously, the diaphragm contracting powerfully. In those who are emphysematous from old standing bronchitis, but little movement of the thorax will be seen save in an up and down direction, with much straining of the sterno-mastoids and other muscles of the neck.

A healthy adult man breathes about 18 times a minute, but a slight variation from this point (above or below) is not inconsistent with perfect health. A new-born child breathes about 40 times per minute. Increased action of the heart by exertion quickly increases the rate of the respirations.

Various morbid causes may lead to an increase in the respirations, and they may rise as high as 60, 70, or 90 per minute. In an acute attack of spasmodic asthma, due to constrictive narrowing of the smaller bronchi, the respirations may quickly reach 80 in the minute. In some abdominal diseases, as
ovarian tumor, dropsy, etc., rapid and difficult breathing is speedily induced by the recumbent position.

In fevers respiration is usually much quickened. This appears to be a result of the high temperature, for the pulse does not always rise in correspondence with the respiration. In pleurisy and pneumonia the respirations are notably quickened.

In laryngeal obstruction inspiration may be much prolonged, so that the respirations become abnormally slow. The same condition is observed in croup. In some diseases of the lungs, followed by affection of the brain, a great slowness of the respirations has been noted. Respiration may fall as low as eight in the minute.

The ratio of the respiration to the pulse is important: more so, indeed, than any absolute frequency of pulse or respiration taken alone. In the adult the natural ratio is 1 : 4, or 1 : 4.5. Dr. Walshe has recorded as extreme pulse-respiration ratios 9 : 1 in chorea; 1:1.25 in acute pneumonia. In hysteria the range has varied from 5 : 1 to 1.8 : 1.

In paralysis of the vagus nerve from pressure of a tumor, or other cause, respiration has been noticed to fall as low as 12 per minute.

There is a special form of dyspnea known as "Cheyne-Stokes respiration," met with in some forms of disease of the heart and brain, which consists in a regularly occurring pause, lasting one-fourth to one minute, during which respiration is completely suspended. This suspension is preceded by a short, shallow inspiration, becoming at length very difficult, then the respiration becomes again shallow, and eventually comes to a standstill, as is just indicated. The whole cycle of the above phenomena is worked in about one and a half minutes. This form of dyspnea is of very serious import, and usually betokens a fatal result.

In persons prone to attacks of dyspnea, it will be observed that the accessory muscles of inspiration, such as the sternomastoid, scalenus and omo-hyoid, stand out prominently. In subjects of old emphysema and asthma this condition of the muscles is well shown. Sometimes, where expiration is very difficult and impeded, the contractions of the accessory expiratory muscles of the abdomen can be plainly seen. Normally, expiration is effected by the elasticity of the lungs alone, but when this natural elasticity is diminished by emphysema or bronchial catarrh, then expiratory aid from the accessory (abdominal) muscles is required.

When a patient can lie flat on his back, his dyspnea is by no means severe, but as it increases he has to raise himself, till at last he sits up erect, and is then said to be in a state of orthopnea, a form of breath-difficulty usually seen in the instances of asthmatic persons, and of those who have dropsy connected with diseases of the heart.

After the expansion of the two sides of the chest has been estimated by the applied palm or surface of the hand during deep inspiration, examination should be made by touch and pressure over the ribs and intercostal spaces, to see if there be any tenderness on pressure. Pain due to periostitis of a rib will be increased by pressure; so, too, will pain due to pleurisy, if pressure be made over an intercostal space, and this pain on pressure is usually confined to the seat of the pleurisy, and does not extend backward along the course of a nerve, as it does when due to intercostal neuralgia. Vocal fremitus is a vibration of the walls of the thorax, perceptible to the hand during speaking in a loud, ringing voice. This vocal fremitus is always most evident on the right side of the chest, the right bronchus being more capacious than the left, and it is generally more perceptible in the upper than in the lower part of the thorax. Vocal fremitus is entirely abolished when one side of the chest is full of fluid, but if the lung be inflamed, as in pneumonia, with its parenchyma consolidated and firm, then the vibration on making the patient speak is notably increased. Thickening of the pleura may cause a very distinct vibratile thrill, felt by the hand applied during respiratory movements.

Bronchial fremitus indicates the presence of diffused bronchial catarrh, and is a noteworthy symptom in the bronchitis of children, as, owing to imperfect expectoration, mucus collects largely in the bronchi. In vesicular emphysema, vocal fremitus is scarcely perceptible unless bronchitis coexists. Fluctuation in the thorax is occasionally felt when much fluid is present in the pleural cavity, by placing the palm of one hand at the back and tapping on the front with the fingers of the other hand. Fluctuation of fluid in pulmonic cavities of large size has been now and then detected.

Percussion is a most important aid to the physical diagnosis of diseases in the thorax or abdomen. What is called immediate percussion consists in striking the thorax directly with the tips of the fingers. It is a method now abandoned, as it does not enable us to distinguish with sufficient precision between the finer shades of difference in the pitch or quality of percussion sounds.
Mediate percussion is practiced by interposing the finger as a pleximeter between the thoracic wall and the percussing finger. The index finger of the left hand is applied closely and evenly to the chest, and then this is tapped with two or three fingers of the right hand kept firmly together. The movement of the right percussing hand must spring from the wrist only, the forearm must be motionless. The blows must be gentle at first, for thus we avoid hurting any tender part, and by this method we obtain accurate knowledge of the density or dullness of superficial parts. When deep-seated structures are the object of investigation, the blow must be more forcible. The blow must be given and the fingers withdrawn quickly, so that surface vibration be not impeded. The only exception to this rule is when we wish to elicit a "cracked pot" note over a lung cavity.

Position of the patient should, if possible, be that of standing or sitting; more accurate results being thus obtained than where the patient is recumbent in bed. While the front of the chest is percussed, the arms should hang loosely by the sides.

The hands may be clasped across the top of the head during percussion of the lateral and axillary regions, and during examination of the back the head must be bent forward and the arms tightly crossed in front.

Percussion should commence at the supraclavicular region, and proceed symmetrically downwards on each side, till, on the left side, at the fourth rib, the heart is encountered, and the note on striking becomes therefore dull as we pass from the air-containing resonant lung to the solid heart. On the right side in health we find resonance to cease at the sixth rib, where we come over the dull-sounding liver.

The resonance of the percussion note over healthy lung is due to the vibration of the air contained in the pulmonary vesicles, in part also to the vibration of the thoracic parietes.

The greater the body of healthy lung beneath the spot struck, the lower will be the pitch, the longer the duration, and the softer the quality of the percussion note. About the fourth interspace, on the right side, a perceptible elevation of pitch on percussion' will be marked; at the same time the applied finger will recognize an increased sense of resistance to firm percussion. The cause of these changes is that the liver lies here behind the shelving border of the lung. On deep inspiration a portion of lung fills out and extends in front of the liver, a fact that a skillful percussor will be able to demonstrate by using very gentle percussion after a very complete inspiration.

At the level of the fourth rib on the left side, the lungs diverge and percussion becomes dull from falling over the heart, and this dullness can be followed outward as far as, or with a firmly given blow, a little beyond, the left nipple. The suprasternal region gives a tubular note on percussion, but sometimes this is modified if there be much cellular substance beneath at the top of the mediastinum. Below the third rib sound is toneless as we approach the regions of the heart and liver.

Percussion of the posterior regions is important. The supraspinous fossae, on firm percussion, give a good pulmonary note. Both infra-scapular regions also should be resonant as far as the eleventh interspace, but on the right side strong percussion will bring out the hard high-pitched liver note as high often as the eighth rib. As a rule percussion of extreme right base never gives so close a note as left extreme base.

When the pulmonary cells are obstructed so that they contain no air, we get what is called a dull percussion sound. With this dullness is associated diminished mass of tone, increase of pitch, and greater sense of resistance; these conditions indicating that the air in the lung is diminished and the lung more or less consolidated, or they may show that fluid is present in the pleural cavity and the lung compressed and airless. We expect, therefore, to detect this dull, toneless note on percussion in cases where (1) the lung is consolidated from exudation into its cells, as in the second stage of pneumonia, or in case of tubercle, cancer, or abscess infiltrating the lung tissue; (2) collection of fluid in the pleural cavity, or a solid or cystic growth or tumor, would be another cause of this dullness; and (3) condensation of lung tissue from dilatation and thickening of a bronchial tube. At times the percussion note is said to be hard or wooden, with raised pitch and increased sense of resistance. This form of note is met with where air is diminished and hard consolidation of lung is present. When found at the apex of a lung, it is a great indication of early tuberculosis. It is also met with at times over a superficial cavity in the lung with a thin indurated adherent wall, or where dilated bronchial tubes are surrounded by hardened tissue, as in the state known as pulmonary cirrhosis.

A third type of morbid percussion resonance is recognized where the lung sounds extra resonant; the mass of tone being increased, the pitch lowered, duration increased, and sense of resistance lessened.

These signs show excess of air in the lung and belong to the diseased states known as emphysema of lung, pneumothorax, and pulmonary hypertrophy. The resonance in pneumothorax and
hydro-pneumothorax may be tympanic or drum-like. A temporary tympanitic note has been observed by Graves and also by Walshe rarely to occur over pulmonic consolidation, and also over the apex of the lung when its lower part is compressed by fluid effusion in pleurisy. Amphoric sound (from amphora, a jar) is more the sort of sound that is heard under the first of the above conditions, according to Walshe, this sound being an exaggeration of tubular sound, and comparable to that which is elicited on filliping the distended cheek. Tympanitic or amphoric sounds on percussion are found where the lung has ruptured, and so caused distension of the pleural cavity with air, as in pneumothorax.

When fluid is present in the cavity of the chest, the dull percussion note can be made to vary by changing the position of the patient, and so shifting the fluid from one part to another. If the fluid be pent up by adhesions, this test fails, and then the best method to solve doubt is to puncture the dull or bulged part of the thorax with fine trocar or hypodermic injection syringe.

A hollow quality in the percussion note over the chest comprises the tubular and amphoric sounds just mentioned, and also a third variety known as the cracked-pot sound. This note can be imitated by striking the back of the hands, loosely folded across each other, against the knee—the contained air being forced out between the fingers at each blow.

Usually this cracked-pot note is associated with an amphoric sound, and it is well shown when percussion is made over a large-sized cavity in the lung, which opens freely into the bronchus and has yielding walls. The patient must open his mouth, otherwise the true cracked-pot note will not be detected, though the amphoric sound may be quite plain; and, further, the percussioning fingers should remain an instant in contact with the pleximeter finger; then, as the air is forced out of the lung cavity through the bronchus and mouth, the peculiar "click" of the cracked-pot will be unmistakable.

In the case of a consumptive adult the presence of this cracked-pot note on percussion is good evidence that a cavity exists in the lung; but in young children the sound may be heard often in cases of bronchitis or of pneumonia at the lung apex. The pliancy of the chest wall in those who are young is the cause of this. In all cases where the chest wall is thickly covered with muscle or fat the percussion note is more or less muffled in sound.

Auscultation, like percussion, of the chest may be mediate or immediate, according as we listen with or without the intervention of the stethoscope between the ear and the chest. In auscultating the lungs we seek to obtain knowledge of: (1) Simple respiratory murmurs; (2) rales, or rattles, produced during respiration by the presence of fluid in the bronchi or lung substance; (3) friction sounds, caused by the rubbing of roughened surfaces on each other; (4) dry, sonorous, and sibilant sounds, due to narrowing of the larger and smaller bronchial tubes. The pulmonary murmur of health is described as a soft, breezy sound, produced by the entry of air into the cells, or alveoli, of the lung, hence it is often called the vesicular murmur.

This being the cause of the murmur, it is easy to understand how it comes to be abolished when the air-cells are impervious from being filled with exudation. In health the vesicular murmur, audible only during inspiration, is heard over the whole thorax, most loudly at those parts which are thickly covered. It is, therefore, loud in the infraclavicular region, feeble at the supra- and infraspinous regions; it is weak where the subjacent layer of lung is thin, as at its border. Greater convexity of ribs on one side than on the other will cause the vesicular murmur to be weak on the convex side.

The pulmonary inspiratory sound is soft and continuous; the expiratory sound is slightly harsher and hollower, as well as weaker and shorter than its predecessor, and in one out of four healthy persons may be quite inaudible on the left side of the chest. The two sounds follow one another closely in health, but as we proceed to listen at points distant from the pulmonary parenchyma, so will the sounds be separated one from the other by a distinct interval. This will be well observed on listening to the tracheal sound over the upper part of the windpipe. The respiratory sounds are always louder in women and children than in men.

Bronchial respiration is best heard between the scapula, at the upper end of the sternum, and over the bifurcation of the trachea; it has not the "breezy" sound of vesicular breathing, but is of a higher pitch, and is not closely followed by expiration. Tracheal breathing is higher in pitch and more hollow than the bronchial sound, and is heard best over the trachea.

The respiratory murmur is usually of higher pitch under the left clavicle, and expiration is always most audible on the right side. In diseased conditions of the lungs the respiratory murmur may be altered as follows:

A. Induration and intensity, becoming (1) Exaggerated or puerile; (2) weak or senile; (3) suppressed.

B. Its rhythm may be: (1) Jerking; (2) deferred; (3) expiration prolonged.

C. Its character may be: (1) Harsh; (2) bronchial or blowing; (3) cavernous; (4) amphoric.

Exaggerated respiration is known by increase of the intensity and duration of the inspiratory
and expiratory sounds. When general over one lung, it probably will be found to indicate that the other one is disabled from acting by inflammation, or some other cause; hence the exaggerated breathing in the sound lung is called supplementary it is also called puerile from its resemblance to the loud strong respiration of young children.

Exaggerated respiration is to be regarded, therefore, as indirect evidence of disease in some part, more or less remote, of the pulmonary substance.

Weak respiration, called also senile respiration, as being characteristic of old age, is marked by diminished intensity and duration of sound. In asthma, pulmonary emphysema and obstructive disease of the larynx and air-passages by thickening or swelling, we get superficial weak respiration. When one side of the chest is full of fluid, we may hear a deep-seated weak breath sound, or all sound may be suppressed, while on the other, healthy, side we hear exaggerated respiration.

In jerking respiration the rhythm of the sound is changed, and it is best noted in the inspiration. This jerky breathing is noted in some spasmodic affections of the air-tubes, in hysteria, the early stages of pleurisy and pulmonary phthisis-usually most notable under right clavicle. Deferred inspiration is often well marked in emphysema of the lung.

The inspiratory movement of the chest commences before any sound is produced. In some cases of consolidation of the lung, an opposite condition to the rarefied state known as emphysema, the inspiratory sound ceases before the expansive movement of the chest is complete. This constitutes unfinished respiration, and is rare.

The normal ratio of inspiration to expiration is as 3 : 1, but it may be changed to 1:4, and such perversion would mark very great and unusual prolongation of expiration, and would only occur in a case of emphysema, where the natural elasticity of the lung was much impaired.

Bronchial respiration, of pathological origin, may be high or low in pitch, and it indicates more or less consolidation of the lung around the bronchial tubes. It is heard very harsh, and high in pitch, when the upper part of the windpipe is compressed by tumors, or narrowed by exudation, as in croup and diphtheria.

When the air-cells of the lung are filled with exudation, as in the hepatization stage of pneumonia, we hear bronchial breathing over the part thus solidified. Under these conditions also we hear bronchophony, or bronchial voice, when the patient speaks, his words being conveyed with a brazen clearness into the ear of the listener in consequence of the solid lung becoming a good conductor of sound.

Bronchial respiration, less intense than that heard during the hepatization stage of pneumonia, can be detected over portions of the lung rendered more or less solid by congestion, by caseous degeneration (phthisis), by chronic interstitial pneumonia with dilatation of the air-tubes, and in the vertebral groove in cases of pleuritic effusion where the pulmonary tissue is rendered airless in compression. Such compression of the lung may result from fluid in the pleura, or from an aneurism or other form of tumor.

The hollow sound of cavernous breathing is heard over a cavity in the lung, and is therefore commonly met with in cases of advanced consumption at the anterior or posterior part of the lung apex. Expiration under these conditions is usually of higher pitch than inspiration, and the sounds often have a whiffing metallic note. In very large lung excavations with dense walls, as well as in cases where the pleura itself is full of air that has escaped from a rupture in the lung tissue (pneumothorax), we get amphoric breathing, hollow, high-pitched and metallic, like the noises produced by blowing into a jug. The amphoric note is heard both with inspiration and expiration, and the best place to hear it is about the middle of the thorax. While listening to the amphoric respiration, the observer may hear metallic tinkling, a sound produced by drops of purulent matter falling from the top to the bottom of the large cavity.

Fluid and air together in the pleural cavity (hydro-pneumo-thorax) produce the succussion or splashing sound on moving the patient from side to side. It should be noted that cavernous breath-sound may be heard over dilated and bulged bronchial tubes (bronchiectasis) when these are surrounded by dense pulmonary tissue. At times cavernous breath-sound is heard one day and not the next. This is due to the cavity being full of secretion; after the patient has got rid of this by coughing the cavernous sound will be very distinct.

The above-named accidental sounds, indicative of disturbances in the respiratory process, are produced in the air tubes, the air cells, or in cavities formed by disease in the lung tissue.

Being formed within the lungs, these sounds may be called endo-pulmonary, as distinguished from the exo-pulmonary sounds produced by pleural friction. Endo-pulmonary sounds may be dry, moist, or indeterminate in character. Dry or vibrating bronchi
may be sibilant and high-pitched, or sonorous and low-pitched.

The sibilant rhonchus, or rale, is a whistling or hissing sound, varying in intensity and duration, co-existent with inspiration and expiration, though now and then limited to one or other act only. The cause of this sound is a narrowing of the smaller bronchial tubes by contractile spasm, as in asthma, or far more often by swelling of their lining membrane with deposition of viscid mucus. Coughing, by altering the position of this collected mucus, will often clear away the rhonchal sound for a time. Persistence of the sibilant rale in one spot indicates narrowing of the bronchial tube there by continuous spasm or by pressure from some growth or tumor. Generally this sibilant rale is found associated with bronchitis in its early and dry stage and pulmonary emphysema. When secretion commences into the air-tubes, then bubbling sounds will be heard, fine at the bases of the lungs, and coarser higher up in the chest.

Sonorous rhonchus, like the sibilant, is of a vibratile character, and is a deep snoring or grating sound, rather more marked in expiration than in inspiration, produced in the larger air-tubes and associated with bronchitis, emphysema and spasmodic asthma.

Mucous rhoncus or rale is a moist sound produced by the bursting of bubbles of unequal size, and it can be modified by coughing and expectoration. The bubbling is audible with inspiration and expiration as the air passes through fluid (mucus, blood or pus) in the smaller air-tubes. The best place to listen is over the central and middle parts of the lung. The disease with which the moist rale is associated is bronchitis after secretion has become established.

Sub-mucous or sub-crepitant due is a weaker and finer bubbling sound, chiefly heard with inspiration, and produced by the bursting of air through viscid fluid in the minute bronchioles. The diseases with which it is associated may be capillary bronchitis of both lung bases, tubercular bronchitis at the apex of one lung, and the resolution stage of pneumonia.

With respect to mucous rales, it should be borne in mind that a few scanty rales may be heard in the chest of many perfectly healthy individuals on causing them to take a few sudden deep inspirations.

The crepitant rale of pneumonia, known as the moist crepitating rale of Laennec, requires a word of special notice. This sound resembles that produced by rubbing the hair of the head between the fingers close to the ear, and it is produced in the chest, in the extremities of the smallest bronchioles and in the air cells, by air forcing its way through glutinous secretion. It is best heard at the close of full inspiration. The fine crepitations are uniform, not unequal, and are not removed by coughing. This condition occurs in the early stage of pneumonia, before the lung cells are blocked with exudation, and so made impervious to air.

In pulmonary edema, or swelling of the lung substance, a condition met with often in dropsy, serous fluid is poured out into the air cells and bronchi, producing an irregular, unequal crepitation as the breath is drawn.

Crepitation may be heard at times over collapsed portions of lung, and over lung compressed by collection of fluid in the lower part of the pleural cavity.

Redux crepitation consists of a slowly-evolved bubbling, audible in expiration as well as in inspiration. It is due to air bubbling through fluid contained in the smaller bronchi, and is indicative of the resolution of pneumonia.

Friction sounds of grazing, rubbing, creaking, grating variety, are due to the rubbing together of two surfaces roughened by the deposit of lymph of varying consistence. When produced between the layers of the pleurae, this sound appears with inspiration, and often, too, with expiration, as a series of abrupt jerks, very superficial, and attended with some degree of thrill or fremitus felt by the applied hand. In old chronic thickenings of the pleura this fremitus may be very marked and the attendant to-and-fro sound very loud. Creaky stretching sounds are heard when the two pleurae are adherent by the intervention of plastic lymph.

As fluid effusion takes place in the course of pleurisy, the friction sound ceases, owing to the two pleural membranes being separated from one another, while at the same time a peculiar bleating twang (goat voice) is heard by the stethoscope when the patient speaks. This, however, ceases as much fluid collects, and then the side becomes dull, and respiratory sound is no longer heard. Friction sounds are usually intensified by the pressure of the stethoscope, as in this way the opposed surfaces of the pleurae are brought into closer contact, and the friction increased accordingly. Rales in the lung and air-tubes are unchanged by increasing the pressure of the stethoscope.

Obstruction of the bronchi by plugs of mucus can be removed by causing the patient to cough, and then, the passage being clear, the respiratory murmur, previously suppressed, becomes audible.
Mucous rales are intensified after the act of coughing. When the lung is solidified cough resonance is increased, and when large superficial cavities are present, auscultation over these, when the patient coughs, discloses a loud metallic ring.

The most sensitive part of the pulmonary mucous membrane is that which protects the larynx and trachea as far as its bifurcation. The mucous membrane of the bronchi is less sensitive.

This will account for the fact that people usually refer their cough to the throat; and when blood is expectorated, as it is first perceived when it comes in contact with the lining of the trachea, patients usually believe it must proceed from the throat.

A few short, slight coughs every morning, with a scanty mucous expectoration, is very significant of early phthisis. Continuous cough, with varying expectoration, is common in all diseases of the respiratory organs. Spasmodic or convulsive cough is best exemplified in whooping-cough.

The examination of the sputa is often of importance. The quantity of the sputum varies in acute as well as in chronic diseases of the respiratory organs. Sometimes in the course of severe acute disease, as senile pneumonia, there is no sputum, and in chronic disease also it may be absent. Children commonly swallow their expectoration. When in bronchitis, pneumonia or A scanty tough sputum, floating in water and beset with specks of blood, is very indicative of pneumonia just commencing in the stage of engorgement.

As hepatization of the engorged lung comes on, the sputum becomes rusty colored from interblended blood, and so glutinous that the vessel containing it may be in-verted without loss of its contents. As resolution of the pneumonia takes place, the sputum becomes yellowish, or of greenish hue from altered hemoglobin, and fragments of small fibrinous casts of the smaller air-tubes may be intermixed.

A fluid sputum of dark reddish-brown or prune-juice hue indicates a low state of vitality, and is of unfavorable import. A greenish-gray, intensely fetid sputum, with shreds of necrosed tissue intermixed, is a sign of pulmonary gangrene. Needle-shaped crystals of the fatty acids are often met with in fetid and gangrenous expectoration.

Ciliated epithelium, when found in the sputum, usually comes from the nasal passages. Columnar epithelium, the lining of the air-passages, is not readily detached, and therefore not commonly found on microscopic examination of the sputum.

Before proceeding to the physical examination of the heart itself, note should be taken of any visible pulsation of arteries or veins about the body, and then the fingers should be placed on the radial artery at the wrist.

The pulse, in a healthy adult beats at the rate of 60 to 80 times per minute, the average being 72; in fever its frequency varies from 80 to 150. A pulse of 140 indicates high fever, and is of grave prognosis. Above this rate the pulse becomes very small, and thready, and is then usually, in acute organic or zymotic diseases, the precursor of death.

It may here be noted that in exophthalmic goitre (Basedow's or Graves' disease) we may have a pulse of 150, though no fever is present. The cause of this unusual rapidity of the pulse is due to irritation of the sympathetic nerve. In young children, from one to ten days old, the pulse averages 101 to 102 per minute. In children of six the pulse usually ranges at 76 during sleep and 92 whilst awake. The pulse in a child varies much under exciting influences, and it is best to count the pulse of a young child, when possible, during sleep, when the circulation is free from nervous disturbing influences.

The rate of the pulse at the wrist is of some value in guiding us to the diagnosis of certain diseases of the heart and blood-vessels. In acute affections of the heart, such as pericarditis and endocarditis, the pulse is always quickened. In chronic valvar diseases of the heart it will be noted that the pulse may be quickened in mitral valve lesions, while it is normal or subnormal in aortic valve disease. A very slow pulse sometimes accompanies atheromatous change in the coats of the aorta, and in cases of fatty degeneration of the muscle of the heart the pulse has been known to fall as low as 30 in the minute. Obscure nervous affections have been reported, associated with a pulse of 18 per minute, the heart itself being in every respect sound and healthy.

A feeble thrill, felt in the radial artery, with a pulse visible to the eye, and of a sudden, short, jerking character, though regular in rhythm, is quite certainly diagnostic of aortic insufficiency, with regurgitation of blood through the valves during the diastole. A firm, resisting pulse, with a hard, rigid feel when rolled under the finger, is indicative of hypertrophy of the heart and more or less atheromatous and calcareous degeneration of the coats of the blood-vessels.

Visible impulse in the arteries is generally a sign of hypertrophy of the left ventricle. Hypertrophy of the right ventricle is not attended with this forcible and visible arterial impulse.

A pulsation of the jugular veins in the neck is sometimes observed independently of any impulse given to the vein by proximity to the carotid artery. This venous pulse is caused by the
regurgitation of a wave of blood, during the systole of the heart, into the superior cava and jugulars. It most commonly depends on regurgitation of blood through insufficient tricuspid valves. This pulse, when thus caused, is most marked in the right jugular vein, and it may be seen reaching as high as the angle of the jaw. Before quitting the subject of arterial pulsation, a few words more may be said respecting the radial artery at the wrist, or the pulse. The regular or rhythmical action of the heart in health is subject to disturbance from various causes, under which the pulse becomes more or less irregular or arhythmical. Nervous disturbance or disorder of stomach and liver may be a cause of irregular action of heart and intermittent pulse. Disease of the valves of the heart, especially of the mitral valve, may produce irregular action, and in old-standing valvular disease, when the muscle of the heart begins to fail, intermittting pulse may be the warning of this change. Sometimes the action of the two pulses at the wrists does not correspond, and then we may suspect an aortic aneurism, the circulation being delayed on the side on which the aneurism lies.

An aneurism may cause a delay between the cardiac systole and the arterial beat at the wrist. Stenosis, or narrowing of the aortic orifice, may produce the same results from the longer duration of the systole.

An intermitting pulse may be due to want of power in the ventricle to drive the blood to the radial artery, so that, after several regular strokes, one or two fail to be perceptible at the wrist. This condition is not incompatible with health, and is due to feeble contraction of the ventricle.

Increase of volume in the pulse depends on increased capacity of the blood-vessel, and on the power of the cardiac contraction. A small quantity of blood circulating in the arteries causes diminished pulse volume, and thus is produced the tremulous and thready pulse of extreme debility.

Extreme tension of the artery by blood causes a hard pulse, not easily compressed; the reverse condition of the weak, relaxed blood-vessel, a soft pulse. Hypertrophy of the left ventricle causes a hard pulse.

The pulse is active, bounding, and rapidly receding in cases of insufficiency of the aortic valves.

The dicrotic or double pulse is marked by a secondary beat, and it is caused by a recoil wave of blood from the closed aortic valves. When the tension of the artery is lessened, as in high fever, this after-stroke is often very marked. A pulse that is obscurely dicrotic is name sub-dicrotic. It is noticed in moderate degrees of fever, and, at times, dyspepsia.

The sphygmograph, an instrument for recording the differential features of the pulse in health and disease, is often of considerable value. In the sphygmograph a lever rises and falls with each beat of the radial artery, over which it is placed on the wrist, and by this rise and fall traces on smoked paper, fixed on a moving dial, the cardiac beat.

The tracing shows that in health the line of ascent of all the arteries is upright and unbroken, and this line is traced by the contraction of the ventricle and dilation of the arteries. Then comes the line, of descent, which is broken and irregular, since the return blood-wave from the contracting arteries recoils on the closed aortic valves and a secondary dicrotic wave is generated by this shock.

When we find the pulse trace without any well-marked notch before the great secondary wave, and the line of descent forming an almost oblique line, it indicates high arterial tension, with full arteries and a hard incompressible pulse. On the other hand, when the line of descent falls suddenly, the arteries are insufficiently filled, and the pulse is soft and compressible.

Force of pulse gives high upstroke from throwing the lever of the sphygmograph well up. In old persons, where the volume of the blood-vessels is large, the trace shows great fullness.

The line of descent in the sphygmogram of a healthy pulse usually shows both the dicrotic and tricrotic recoil waves.

Tricrotism is due to a recoil wave from the capillaries, or to secondary contraction of the elastic vessel-wall.

The heart lies obliquely in the thorax behind the middle and lower bone of the sternum and the cartilages of the third, fourth, and fifth right ribs near the sternum, and the cartilages of the third, fourth, fifth and sixth ribs on the left of the sternum.

The heart rests upon the cordiform tendon of the diaphragm; its base is on a line with the interval between the cartilages of the second and third ribs, and ,the impulse; of its apex can be seen and felt between the fifth and sixth ribs, slightly to the left of the junction of the fifth rib with its cartilage, and on a line with the junction of the xiphoid cartilage and the sternum. The true apex lies behind the sixth rib, covered in front by a tongue-like process from the left lung.

Deep inspiration tends to lower the heart's apex, and, by distending the lung, weakens the force of the impulse.Expiration has the reverse effect. A full stomach raises the apex. Enlarged liver may push the apex upwards and to the left. All enlargements of the heart depress the apex-beat, and may
carry it as low as the eighth rib. Effusion of fluid into the sac of the pericardium always raises the apex-beat. In children the apex of the heart may lie naturally as high as the fourth intercostal space. Effusion of fluid or escape of air into the left pleura will carry the apex-beat over to the right side of the chest.

The region of the heart's superficial dullness known as the precordial region, corresponds to a vertical line through the center of the sternum. About the middle of the bone, nearly level with the cartilage of the fourth rib, the edge of the left lung separates from the middle line and passes obliquely to the left side, thus exposing a small portion of the pericardium in the form of a sort of triangle, the apex above, the base below. The parts of the heart uncovered by lung, and in contact with the thoracic wall, are a part of the left ventricle near its apex, and also a part of the right ventricle.

A dull space is thus formed, which can be mapped out by careful and light percussion, and it will be found that its base is level with the cartilage of the sixth rib; its right boundary a vertical line through the center of the sternum, and its left boundary is an oblique line through the cartilages of the fifth and sixth ribs on the left side. The lower boundary corresponds with the lower border of the right ventricle. The heart, as a whole, extends vertically from the second space to the sixth cartilage, and transversely from a little within the left nipple to a finger's breadth or more to the right of the sternum. These are the limits of the deep cardiac region. The deep-seated cardiac dullness extends vertically from the third to the edge of the sixth cartilage, and transversely from the left nipple to a little beyond the right edge of the sternum, opposite the fourth cartilage. Difficulty is experienced in defining by percussion the boundary between the heart and the liver.

The pitch of liver percussion is always higher than that of the heart, and sometimes a narrow line giving a tubular note can be defined between the two organs.

Alterations in the area of the heart's percussion dullness may be produced in various ways.

1. By effusion of fluid into the sac of the pericardium. This event may occur as part of a general dropsy, but is specially prone to happen as a consequence of acute pericarditis in the course of rheumatic fever.

Inspection may show arching of the precordial region, bulging of the interspaces, and elevation of the left edge of the sternum, the beat of the heart will have an undulatory movement, and the apex may be raised as high as the fourth interspace.

Percussion discloses increase of the precordial dullness, which can be made out in a triangular form, base below, apex above. This triangle of dullness may, when effusion is large, extend from the right para-sternal to left axillary line, while the apex of the dullness reaches to the second left interspace. Upon these conditions the beat of the heart's apex will not be perceptible unless the patient lie flat on the back; then the apex may be again found as the fluid falls back by gravitation, provided the heart be not held fixed by adhesions. The more mobile watery fluid that is poured out in dropsy of the pericardium (hydro-pericardium, or hydrops pericardii) shifts about more freely than the more glutinous exudation of acute pericardial effusion. A bulging of the abdomen is sometimes noticed in cases of great pericardial effusion.

2. Cardiac dullness is increased in extent and intensity in hypertrophy and dilatation of the heart.

There may be a general hypertrophy of the whole heart in all its compartments, and in this case it is always, according to the experience of Walshe, of the dilated or eccentric kind. In such a case of general hypertrophy the cardiac dullness will be increased laterally and downwards, and the impulse diffused generally.

In cases of hypertrophy of the left ventricle, the thickness of the muscular wall may increase from the normal amount of half an inch to as much as two inches. The area of dullness is increased towards the left, and the apex beat may be found as low as the seventh rib, or when there is much dilatation as well as hypertrophy of the ventricle, even to the eighth rib. The impulse of the heart may also be felt in the back.

Percussion dullness in dilated hypertrophy may reach from the second to the eighth rib, and transversely one or two inches across to right of sternum.

The left ventricle is the compartment of the heart most commonly affected with hypertrophy; next in frequency comes the left auricle, and then the right ventricle; last comes the right auricle—a cavity which, however, has been found so much dilated as actually to displace the liver. In one case it contained eight ounces of blood clot.

In hypertrophy with dilatation of the right ventricle, it is chiefly the transverse area of cardiac dullness that is increased. The impulse of the heart is not so strong and heaving as in dilatation of the left ventricle, and passes further to the right than is normal. It may extend to the right mamillary line. There may be some bulging of the lower part of the sternum.
Where the enlargement of the ventricles of the heart is due to simple dilatation, without notable hypertrophy and thickening of the muscular wall, there is not seen any prominence of the cardiac region. The apex-beat is diffused and not distinctly seen, the force of the impulse is unequal and the rhythm irregular. With these signs there is good reason to suspect fatty infiltration, or even fatty degeneration, of the muscular tissue of the heart's wall, and this opinion is confirmed if there be symptoms referable to the brain in the form of vertiginous and apoplectiform seizures.

In hypertrophous dilatation of the heart's cavities the walls are thickened and the power of action increased. In simple dilatation the thickness of the cardiac wall is very slightly augmented, but the capacity of the cavity is increased.

In passive dilatation the walls become very thin and attenuated, and here the intensity of superficial cardiac dullness is less than in the hypertrophous form of dilatation.

Dilatation carried to any extent involves both ventricles, but sometimes it is limited to the right ventricle.

The apex-beat in general cardiac dilatation is not readily pointed out; it may fall nearer the sternum than the natural point in consequence of the rounded-off form which the heart assumes when dilated. The area of percussion dullness is notably increased in the transverse more than in the vertical diameter. Whenever the heart is being examined by percussion, the patient should lie flat on his back and on no account move his limbs or shift his position during the examination.

In health the contraction of the heart gives rise to two sounds with a short pause between them. The first of these is the systolic sound, and is synchronous with the systole or contraction of the ventricles. The second, diastolic, sound marks the beginning of the diastole of the heart; then follows the cardiac pause, which lasts till the next systole. The first, systolic, sound, is more clearly accentuated at the apex of the heart and over the lower border of the sternum than is the second, diastolic, sound, which has its point of greatest intensity at the second intercostal space, close to the sternum.

The first sound of the heart is of a mixed character, one of its causes being tension of the auricula-ventricular valves, due to the shock of the mass of blood thrown against them during the cardiac systole. The sound produced by the action of the heart against the chest wall is too slight in the normal state of things to be audible to the listener, but when the heart is a little enlarged, or temporarily excited, then a sort of rub is heard with the systole, which probably soon subsides under the influence of rest. The prolonged booming character of the first cardiac sound has been held since the days of Laennec to be due to the act of muscular contraction.

The second sound of the heart is produced by the recoil of the blood upon the surface of the sigmoid valves, together with the sudden tension of these valves. To appreciate the varying character of the heart sounds at different points of the chest is very difficult, but very necessary, as the basis of observation on the organ in disease. At the left apex of the heart the first sound is dull, prolonged and strongly accentuated. The second sound is but half as long as the first, clear, abrupt, short and of high pitch. Moving across to the right, the stethoscope will come over the right ventricle, and here the first sound is clearer, shorter, and less accentuated than it is over the left apex-beat. The right ventricle has thinner muscular walls than the left; hence its systolic sound is shorter. At the base of the heart, or level of left and right second interspaces, the first sound is dull and without accent. The second sound is accentuated both to right and left, but chiefly at the right side.

In listening for morbid sounds connected with valvular disease of the heart, it is found in practice not always best to place the stethoscope exactly over the anatomical site of the valves we are investigating. Thus sounds emanating from the mitral valve are not sought directly over the valve, the attached border of which lies on the level of the union of the third cartilage with the sternum, but lower down at the apex of the heart, where no lung intervenes.

Sounds connected with the tricuspid valve are heard best at the lower part of the sternum. Pulmonary valve sounds are most clearly conducted over the anatomical site of the opening of the vessel at the sternal insertion of the third left costal cartilage.

Aortic valve sounds are loudest not just over the vessel, in left intercostal space, but in the second right space in the direction of the ascending aorta.

Enfeeblement of the sounds of the heart may proceed from a great covering of fat over the chest. Pathologically, weakness of the first sound is noticed in the debility of convalescence and in the course of some acute diseases; also in fatty degeneration of the muscle of the heart and in cardiac anemia or bloodlessness, often a precursor of fatty degeneration, the sounds are weak. In true fatty degeneration the first cardiac sound is weak, short, and relatively high pitched; then comes a long first silence and a feeble, but relatively distinct and accentuated, second sound (Walshe). If, as often happens, the fatty change be in excess in the left ventricle, the first sound may be of notably fuller tone
on passing to the right. Attacks of syncopal or of apoplectiform nature often attend these cases of fatty heart. The presence of the arcus senilis in the eye, due, as Canton has shown, to fatty atrophy of the cornea, is of some value as corroborative evidence of fatty heart if the patient be not far advanced in years.

Softening of the muscle of the heart and acute fatty necrosis of its fibers are apt to take place in typhoid and typhus fevers, and especially in those cases where the patient has been much weakened by any hemorrhage.

Pericarditis, or inflammation of the tissue of the pericardium, is known in an acute and chronic form. The disease passes through five stages: (1) Dryness and vascularity, (2) plastic exudation, (3) liquid effusion, (4) absorption, (5) adhesion of the two layers of pericardium.

It is exceedingly rare to find inflammation of the pericardium appear as a solitary disease, but it may be developed in the course of a variety of diseases, and especially during rheumatic fever, and next to that during the later stages of Bright's disease of the kidney. It has appeared as an idiopathic affection in very poorly nourished children, friction sound being remarkably well developed.

The essential auscultatory sound of pericarditis is a friction or rubbing sound; with this there is more or less increase in percussion dullness, some tenderness and twisting upwards of the cardiac apex.

Pericardial friction is usually best heard just above left nipple or behind the sternum, increased by pressure of the stethoscope, and continuing when the patient stops breathing. The clicking, grazing or rubbing sound may accompany both systole and diastole of the heart or either singly, and the sound appears as if produced just under the surface. Friction of the grazing kind may vanish entirely in as short a time as six hours, and that without the occurrence of any liquid effusion. The cause of the friction sound is the roughening of the surface of the pericardium by plastic lymph exuded upon it. When this is quite recent, a grazing friction is heard; when more chronic, the sound becomes rubbing, grating or creaking in character. Generally, when we cease to hear the friction sound, it is because fluid is poured out, and so the two layers of pericardium are separated the one from the other. As fluid increases, the heart sounds become muffled and weak, and the percussion dullness assumes the form already described. It is remarkable that the friction sound is not necessarily abolished as fluid effusion comes on, for in a case recorded sixty fluid ounces of liquid effusion were found in the pericardium of a man over whose heart friction murmur was distinct a few hours before his death.

There are a few points in the diagnosis of pericardial friction sounds worthy of attention. A friction sound produced by inflammation of the left pleura may be of cardiac rhythm, and so confuse the observer. Pleural friction sound is increased by deep breathing, and ceases when the act of breathing is suspended.

An exocardial friction murmur is distinguished from an endocardial murmur, due to valvular disease, by the changeableness of its seat and intensity from hour to hour, its superficial and limited character, and its non-transmission in the course of endocardial murmurs further serve to mark the exocardial sound of inflamed pericardium.

The endocardial cardiac murmurs are (1) inorganic, (2) organic. These may be of systolic or diastolic rhythm, and when of the first, the murmur may be inorganic and significant then of a spanemic and weak state of the blood, or of coagulation of blood in the heart's cavities. A murmur of diastolic rhythm is never inorganic. A systolic inorganic murmur is soft and gently flowing, basic in seat, and usually best heard over the pulmonary orifice at the second left or "pulmonary" cartilage. This inorganic murmur can also be heard over the orifice of the aorta, but it is not conducted up the vessel, nor can it be heard outwards towards the axilla or down at the cardiac apex. It is rare to hear an inorganic murmur at the mitral orifice, but unequal tension of the valve segments, it is said, may cause such a transient murmur. Murmur due to coagulation of blood is most common on the right side of the heart. The coagulation of blood, or intra-cardiac thrombosis, is prone to occur as a very serious complication in rheumatic fever, croup and pneumonia. Extension of percussion dullness to right and irregular action of heart with murmur marks the event. It must be remembered that inorganic systolic base murmur is not uncommon in many acute diseases when the blood becomes poor and thin.

Venous murmurs are best heard in the external and internal jugular and subclavian veins. These "humming-top" murmurs are invariably continuous in rhythm, and are at once silenced by pressure on the vein with the stethoscope. A thin anemic condition of the circulation is the most probable cause of the existence of these humming venous murmurs.

In inflammatory endocarditis, so often met with in the course of acute rheumatism, organic cardiac murmurs may be thus arranged in their order of frequency: Aortic obstructive, mitral regurgitant, aortic regurgitant, aortic obstructive and mitral regurgitant, and aortic obstructive and regurgitant together. Pulmonary murmurs are infinitely rare.
Surface-roughness, fissuring, and lymph deposits are the main causes of the obstructive class of murmurs; while those of regurgitant character may be traced to intertwined lymph impeding the play of the tendinous cords and papillary muscles. An endocardial murmur early developed under observation during an acute attack, is pretty good evidence of endocarditis, and if it be observed to persist all through the acute attack, it will probably remain as a permanent condition; at any rate, if some months after the attack it be not audible, owing to weak action of the heart, a little extra effort on the part of the patient, by exciting the heart, will soon show whether it be really gone or not. Recent endocardial murmurs of soft tone have been known to go quite away after continuing two or three weeks. The disappearance of the murmur in these instances has been set down to the absorption of a recent lymph exudation on one of the cusps of the mitral valve.

The murmur of aortic obstruction, constriction or stenosis, is produced by the onward current of blood meeting with obstruction at the seat of the aortic valves. The pulse is not materially affected unless the aortic constriction be great, then, though regular in force and rhythm, it becomes small, hard and prolonged, and this shows that there is some hypertrophy of the left ventricle forcing the blood powerfully into the arteries through the aortic obstruction. Constriction of the aortic orifice does not per se cause any swelling of the ankles, or dropsy. The murmur indicative of aortic constriction and obstruction may be so prolonged as to cover not only the first, but also the second sound at the base of the heart, but this is not common; what we usually hear is a murmur whose point of greatest intensity is at mid sternum, opposite the third interspace, gradually losing force as we pass to the apex, where it may be quite inaudible, so that we hear the natural sounds of the heart at this point. The murmur is audible at the second right cartilage, faintly so at the second left, and it can be heard on the left vertebral groove, and up toward the vessels of the neck, being carried in the direction of the blood-current. Usually this murmur is high in pitch, loud, prolonged and harsh. Occasionally the second sound is reduplicated at the base.

A systolic onward murmur, of maximum force at or just outside the apex-beat, faintly or not at all audible at ensiform cartilage at the base of the heart, but clearly heard in left axillary line and round to inferior angle of scapula, is due to regurgitation of blood through the mitral orifice at the moment of ventricular systole, into the left auricle of the heart. This murmur is seldom of high pitch; it may entirely cover the first sound of the heart at the apex, but this sound may be quite natural at the base of the heart, and just to right of ensiform cartilage.

The second sound of the heart, usually in health most accentuated over the aortic valves, is in mitral regurgitant disease most accentuated or intensified over the pulmonary valves. The reason is that the left auricle and pulmonary veins being over-distended with blood, the right heart has to act with greater force, and hence increased pressure falls on the pulmonary valves.

Sometimes the second sound is notably distinct and sharp at the apex.

A transient mitral systolic murmur is met with at times in the course of chorea, and seems then to be produced by irregular or convulsive action in the musculi papillares.

The pulse in mitral regurgitation is variable. In slight cases it may be fairly natural, in other cases it is irregular in force and rhythm. Dilated hypertrophy of the left ventricle is the common sequence of mitral regurgitation. The systemic system of vessels is not soon affected, and we do not therefore see any dropsy unless the dilatation of the heart has become general. The stress of mischief falls on the pulmonary circulation, so that we get cough with watery expectoration, dyspnea, pulmonary edema and apoplexy among the results of prolonged mitral regurgitant disease. The liver also becomes eventually liable to congestion, as also the kidneys, and if the heart becomes much dilated we may find albumin in the urine.

Mitral constriction or stenosis is evidenced by a thrill or tremor, perceptible by the fingers applied over the cardiac apex, and by a murmur of diastolic rhythm loudest just above the heart's apex, and not, audible posteriorly, and the lower angle of the left scapula. This murmur, at first feeble and soft, may towards the end of the diastole be rough and grating in character.

Sometimes, in cases of narrowing of the left auriculo-ventricular passage, no murmur is audible over the apex of the heart at the beginning of diastole, immediately before the systole; it is then recognized as a presystolic murmur. Very commonly mitral stenosis is complicated with mitral insufficiency; then the presystolic murmur passes into the systolic murmur indicative of mitral regurgitation. Pulmonary congestion and hemoptysis are among the frequent results of mitral stenosis, the second pulmonary valve sound becoming intensified, and the right ventricle of the heart dilated and
hypertrophied.

Tricuspid-valve murmurs are very rare. A systolic murmur, most distinct over the lower part of the sternum, systolic pulsation of the jugular veins, and sometimes enfeeblement of the second pulmonary valve sound from lowering of blood-pressure, are the signs which indicate regurgitation of blood through the tricuspid valve.

A diastolic murmur over the lower part of the sternum, and presystolic pulse in the jugular veins, would indicate the exceedingly rare condition of tricuspid stenosis.

Aortic valve insufficiency is known by the presence of a diastolic murmur, loud and of maximum intensity over the greater part of the sternum. Usually the first sound also is murmurish, owing to the roughness of the aortic valves. By applying the finger over the subclavian or carotid artery during auscultation, the diastolic rhythm of this murmur is appreciated.

Owing to the reflux of blood in the diastolic back into the left ventricle, this cavity tends to enlarge and elongate, so that the visible apex beat is carried downward and to the left. The murmur, however, is usually louder at the ensiform cartilage than at the apex of the heart.

The pulse is jerking, rapidly receding from the finger and usually very visible, especially when the arm is raised. This visibility of the radial pulses is not, however, peculiar to cases of aortic regurgitation, for it is sometimes found in association with the gouty diathesis.

A diastolic murmur, most marked in the second left intercostal space, might show constriction of the orifice of the pulmonary artery, and is especially associated with hypertrophy of the right ventricle. Aortic aneurisms give rise often to systolic murmurs and tactile thrill. With these signs we have local bulging, neuralgic pains, and distended veins as results of pressure. Aneurisms of the aorta lead to hypertrophy of the left ventricle when, as is usually the case, the aortic valves are at the same time insufficient. Should these valves remain competent to close the aortic orifice, there need be no ventricular hypertrophy.

Aneurism of the aortic arch is known from an enlarged heart by the fact of there being in the case of aneurysm two distinct centers of pulsation—one of the heart, the other of the aneurismal tumor.

Of tumors likely to be confounded with aortic aneurism, it may be remarked that infiltrated cancer of the lung produces no local prominence, deepens the intercostal spaces, and does not produce pressure signs.

A syphilitic tumor, or pulmonary syphiloma, would be influenced more or less by mercurial remedies.

Mediastinal tumors often closely resemble aortic aneurisms. Common features are dullness and non-resilience, usually extending across the middle line. The conditions in favor of aneurism would be: situation in the course of the arch of the aorta; vibratile thrill; marked accentuation of the second sound over the prominence; gradually increasing nearness of pulsation to the surface; double impulse; dysphagia, and gnawing boring pain over spine or sternum.

Aneurisms of the descending aorta give murmurs loudest over the sac, and, by pressure on the bronchus, weak breath-sound in the corresponding lung. Shooting pains like rheumatism are prominent features in some cases. These aneurisms often rupture into the esophagus, or into the right or left pleura; then collapse and death rapidly occur.

The abdomen is divided anteriorly into the epigastric, umbilical and hypogastric regions, taken in order from above downward. The lateral regions on either side are divided into right and left hypochondriac (that is, lying under the rib cartilages), right and left iliac, and right and left inguinal, or groin regions. The posterior regions embrace the inferior dorsal on the right and left, and the right and left lumbar regions.

In the epigastric region lies the stomach, its lower border or larger curvature crossing the umbilicus. A small portion of the anterior surface of the stomach and the larger part of its great curvature, are in direct contact with the abdominal parietes anteriorly; the rest of the organ is covered over partly by the left lobe of the liver and partly by the left lung.

In examining the stomach the patient must lie on his back and the upper limit of the stomach defined by percussion along the line where the resonant pulmonary note gives place to the tympanitic stomach-note. The boundary of the stomach to the right may be determined by following the dull liver-note till this ends in the lower margin of the cardiac dullness. The definition by percussion of the lower border of the stomach is not easy, because there lies just below it the transverse colon, which commonly gives, on percussion, a tympanitic note like that of the stomach. Enlargement of the tympanitic space occupied by the stomach indicates dilatation of the organ—a condition commonly found in gastric catarrh and in stricture of the pyloric outlet. When much dilated, the stomach has been known to extend far over the middle line to the right, and beyond the left axillary line.
Cancer of the stomach, which most frequently affects the pyloric end, manifests itself externally as a circumscribed elevation or tumor in the epigastrium, hard and firm to the feel, and more or less tender. Cancer of the left lobe of the liver will produce a similar elevation of the epigastrium.

A pulsating tumor in the epigastrium to the left of the spinal column would be suggestive of aneurism of some part of the abdominal aorta, but it must be remembered that in persons of hysterical or gouty temperament violent pulsation of the abdominal aorta is at times met with of a purely nervous character. The aneurismal tumor has an expansive movement under the fingers, and is usually the seat of a systolic murmur.

In the right hypochondriac region lies the liver, occupying the concavity of the diaphragm with its upper convex surface, while that portion of it which is in contact with the thoracic and abdominal wall extends on the front of the chest from the sixth rib superiorly to the margin of the arch of the ribs inferiorly, and reaching in the median line to midway between the base of the ensiform cartilage and the umbilicus. To the left of the median line it is scarcely possible to define the upper limit of liver dullness as it merges into that of the heart.

In the right axillary line, or line falling from the center of the axilla, the upper margin of hepatic dullness corresponds to the seventh intercostal space. In the right dorsal line, falling from the lower angle of the right scapula when the arm is dependent, hepatic dullness corresponds to the ninth intercostal space. This posterior dullness extends downwards to the twelfth rib, where it merges in the dullness of the right kidney.

After deep inspiration the lower margin of the liver may be depressed from half to one inch below the margin of the ribs when the patient stands erect. The under surface of the liver is opposed to the stomach and large intestine and the right kidney and suprarenal capsule.

The liver is proportionately larger in infancy and childhood than in adult life. In the adult the average weight of the liver is one-fortieth of that of the entire body, whereas, previous to puberty, it may be as much as one-thirtieth, or even one-twentieth.

In cases of rickets the liver is often depressed and elongated from lateral compression. Tight lacing is another well-known cause of depression and apparent enlargement of the liver. Fluid collected in the right pleura, and, more rarely, in the pericardium may also depress the organ. When the liver is depressed by a pleural effusion its lower margin is not changed by very deep inspiration.

It may be here remarked that before pronouncing any opinion as to the nature of an abdominal tumor, it is well that the bowels be well cleared out, for hardened collection of feces in the various parts of the colon have been mistaken for all manner of abdominal tumors. Hardened scybalae in the transverse colon have been mistaken for the nodulated edge of a cancerous liver.

Congestion of the liver from excess of blood therein will produce a general and uniform enlargement of the organ, so that it may project an inch or more below the ribs in the right mammary line. The enlargement may be due to venous mechanical congestion from valvular cardiac obstruction, and in such case sooner or later it will give way to the opposite condition of contraction.

The pressure exercised by the distended hepatic veins causes atrophy of the central portion of the lobules, and so causes a granular condition of the liver; different, be it remembered, however, from the contraction of the cirrhosis, where the atrophy commences at the circumference of the lobules.

In active hepatic congestion, where the engorgement commences in the arterioles, the enlargement is less marked than in the mechanical form of the disease. In hepatic congestion there is a feeling of painful distension in the region of the liver, the surface of the enlarged organ is smooth, and usually in a day or two the conjunctivae become yellow, and more or less of a jaundiced hue tinges the skin, while the tongue is furred and the stomach irritable.

When the enlargement of the liver is due to an obstruction, however caused, of the biliary duct, jaundice is a marked symptom; the stools are white and free from bile, while the urine is dark and bilious looking.

Abscess of the liver, whether due to pyemia or to dysentery and long residence in a hot climate, will cause a very painful swelling of the liver.

Often the organ enlarges upwards, and the abscess may burst through the diaphragm and pus be coughed up from the lungs mixed with more or less blood. Shiverings, great pain on pressure, and on movement from side to side, and the general history of the case, point to abscess as the cause of the hepatic enlargement.

In waxy or lardaceous enlargement the liver undergoes greater enlargement than from any other disease except cancer. A lardaceous liver has been known to weigh 180, instead of the normal 50 or 60 ounces. On palpation the enlarged liver is felt extending below the ribs as a dense, firm, resisting mass. The outer surface is smooth, and the lower margin rounded and free from indentation. The smoothness of the edge distinguishes this form of liver disease from cancerous or syphilitic affection of the organ.
In waxy enlargement of the liver there is rarely any jaundice or ascites, and other organs, as the spleen and kidneys, are usually affected with the same waxy change that affects the liver. Protracted suppuration of some part or other of the body is the common cause of lardaceous disease of organs.

Fatty liver, like the preceding, is an example of a painless enlargement of the liver. The extent of overgrowth in the size of the liver may extend nearly to the umbilicus. The ribs are not bulged, and the surface of the liver is smooth and its margin even and rounded. Jaundice and ascites very seldom are found in connection with the fatty liver. The skin looks very bloodless and has a semi-transparent waxy appearance. Fatty liver is common in cases of advanced pulmonary phthisis. Hydatid tumors constitute another cause of painless enlargement of the liver attended with very little constitutional disturbance.

The tumor may attain a great size, is smooth, painless, and free from irregularity. If there be several cysts then the organ may have a lobulated feel and appearance. If the case be very obscure, a cyst may be punctured and an alkaline fluid abounding in chloride of sodium can be withdrawn, in which the microscope will reveal echinococci or shreds of hydatid membrane, thus making clear the nature of the case.

Cancer of the liver may be secondary to cancerous disease of the pylorus. The enlargement of the liver is great—a cancerous liver has been known to weigh 250 ounces—and if the cancerous growths press on the common bile duct, persistent jaundice will be the result, as has been observed in many instances. The enlargement is progressive, and in the softer forms of cancer may be so rapid that a weekly increase of growth may be noted. To the feel the enlargement is usually irregular, but sometimes the cancer is gathered into one large central mass, and the disease may be confined to the left lobe only. The tumors are always more or less tender on pressure, and sometimes general outline of the liver is tolerably regular. This occurs when the cancer is of the infiltrating rather than of the nodular variety. Jaundice and some-times abdominal dropsy (ascites) are symptoms in hepatic cancer.

Contractions of the liver are observed in cirrhotic contraction of the organ and in acute yellow atrophy of the liver. Marked diminution of the area of the normal hepatic dullness with ascites distinguishes the first of these states, and acute jaundice and fever are concomitants of the second, much rarer, form of atrophy.

Ascites, or abdominal dropsy, is a condition very important of recognition and requiring distinction from pregnancy, ovarian dropsy, and some other forms of abdominal enlargement. The signs of ascites are these: (1) Enlargement and uniform swelling of the abdomen. (2) Percussion note dull in the flanks, whither the fluid gravitates as the patient lies on his back. In the center, where the intestines float up, percussion will yield a tympanitic note. (3) Fluctuation of the fluid is felt by placing the left hand flat on the side of the abdomen, and then tapping on the other side with the fingers of the right hand. With care even a few ounces of fluid in the cavity of the abdomen may be detected by this procedure.

Ovarian cysts are known, when in the early stage, by their appearing from one side of the abdomen, and the outline can often be defined by the fingers. As the cyst grows it ascends in front of the intestines, so that the prominent part of the abdomen is dull to percussion while the flanks are resonant, just the reverse of the condition met with in ascites.

In ovarian tumors the distance between the umbilicus and the crest of the ilium may differ on the two sides, being greater on the side from which the tumor has sprung. This never occurs in ascites. The umbilicus does not protrude in the case of an ovarian tumor. Sometimes a coil of intestine crosses over an ovarian tumor or any other form of abdominal tumor, then a belt of tympanitic resonance will be found following the course of the intestine.

When ascites and ovarian dropsy co-exist, changing the position of the patient and observing the gravitation of the fluid will aid to clear up the diagnosis. Hydatid cysts usually grow from the liver, but the possibility of such a cyst originating in the pelvis and growing upwards must be kept in view. Puncture of the cyst and examination of the evacuated fluid would be necessary to settle the diagnosis.

To feel or palpate the spleen the fingers must be thrust well under the margin of the ribs on the left side, while the patient draws a long breath. If the organ be slightly enlarged, it can then be felt as a smooth mass with a notch on its anterior and inner border. When very large, the spleen grows in direction downwards and inwards towards the median line. It is only when very large that the spleen extends upwards against the diaphragm.

Tumors in the substance of the spleen are very rare; the enlargement generally maintaining the shape of the spleen, with its notches or indentations, which are very readily felt. The surface of the enlarged spleen is smooth and free from irregularity. The acute diseases in which swelling of the spleen should be looked for are typhoid and typhus fevers, smallpox, relapsing and intermittent fever.
and pyemia. In old standing cases of ague the enlarged spleen is called the ague cake.

In general lardaceous or waxy disease of the organs of the body and in syphilis the spleen is often enlarged. In leukemia, the disease in which there is excess of white blood corpuscles in the circulating fluid, enlarged spleen is constantly met with. The spleen can at times be moved about freely, in consequence of a lax state of its ligaments.

The anatomical relations of the kidneys prevent our being able, by percussion, accurately to define the extent of either of these organs. Posteriorly the space included between the lower edge of the eleventh dorsal and the upper edge of the third lumbar vertebrae corresponds to the region of the kidney, and here it is covered by the mass of the sacro-spinalis and quadratus lumborum muscles.

When the kidney is much enlarged by distension with fluid, as in hydronephrosis, or with pus, as in pyelitis, it can be felt by the hand through the anterior abdominal wall as a soft fluctuating spherical tumor. If the pus or other fluid suddenly finds exit into the urine, the tumor of the kidney rapidly subsides.

The kidney appears sometimes, more often in women than in men, to become dislocated from its normal position and free to move, so that when grasped by the hand it slips from the fingers as a smooth, painless, bean-shaped body. To feel the kidney thus the flank must be well grasped in the hand, the fingers being below and the thumb above.

In examining the course of the intestinal canal the hand may encounter masses of hard fecal accumulations, the recognition of which is very important. This sort of tumors are usually felt on the right or left side of the abdomen in the course of the colon, as irregular, movable, somewhat tender masses.

The diagnosis is made certain by noting the effect of purgatives and enemata in removing the accumulation. When there is a stricture of any part of the intestine, the peristaltic movements of the bowel can be seen and felt in the portion of the canal above the stricture.

Large collections of fluid in the stomach and intestinal canal give rise to dullness on percussion, and gurgling, splashing movements on palpation by the applied hand. Gas in the intestine or stomach yields a more or less tympanitic note on percussion.

The diagnosis of stricture of the rectum and of fissure, piles, or cancerous disease of that part, is made out by examination with the oiled finger passed well up into the gut, and also by the use of the rectum bougie and the anal speculum.

Only when the uterus is enlarged can it be felt through the abdominal wall. At times firm sub-peritoneal fibroid tumors grow from the womb, and extend into the abdominal cavity, where they are felt as hard masses.

By passing the uterine sound into the cavity of the womb, it will be discovered that the abdominal tumor moves as the uterus moves, and this is a proof of their intimate connection. It may be observed that the passage of the metallic sound into the uterine cavity at times gives rise to discharge, much pain, and sometimes even peritonitis; hence, before using the instrument, the practitioner should study the method of its employment in some special work on uterine diseases. After its employment the patient should rest during the remainder of the day on sofa or bed.

By means of tactile examination of the uterus per vaginam, we ascertain if there be any hardness, irregularity or thickening about the os and cervix uteri. We further observe any undue heat, tenderness, weight and want of mobility about the uterus. By means of the sound passed through the cervical canal into the uterine cavity, we discover the length of the cavity, and whether the cervical canal be duly patulous and free from constriction.

The adult healthy uterus measures from the margin of the lip to the fundus nearly three inches, and its breadth between the two Fallopian tubes is about two inches or rather more. The length of the transverse chink or os uteri is from three-eighths to half an inch. The os, it may be observed, varies in form in different individuals; usually it is a transverse slit, but with some it is circular, and in others triangular—especially is it thus found in women who have borne many children. It is generally about the size of a goose quill or rather smaller.

The cervical canal is from half to three-quarters of an inch long; it first widens then contracts again, where it enters the cavity of the uterus. The mucous membrane lining the canal of the cervix is disposed in rugae, branching out from a center, and this has been called the arbor vitae. In passing the sound, especially if it be a small one, care must be taken not to get the bulbous point hitched and arrested among these rugae of the arbor vitae.

The weight of the virgin uterus is from seven to eight drachms, but after child-bearing it amounts to an ounce and a half.

The lower portion of the uterus can be investigated by the finger per vaginam and examination with the vaginal speculum, which show any erosion or ulceration of the os or change of color, and
through, the speculum local applications to diseased parts can be made.

The ovaries are the essential organs of generation in the female, and are oval bodies, each about an inch and a quarter long, hanging loosely in the pelvis, and attached to either side of the uterus by the posterior duplicature of the broad ligament known as the ligament of the ovary.

To investigate diseased conditions of the ovary in an early stage, the intestines and bladder being emptied, the patient must lie on her back with knees drawn up so as to relax the abdominal muscles, and then pressure should be made backwards towards the brim of the pelvis, from a point a little above the curve of Poupart's ligament. Swelling and tenderness of the ovary will thus be detected.

In pregnancy the uterus rises as a rounded tumor above the symphysis pubis about the fourth month. The abdominal enlargement increases uniformly, and when the gravid uterus reaches the umbilicus, it pushes it forward, so that in the sixth and seventh month it is about level with the surrounding skin, and afterwards it projects beyond it in most women.

To the feel, the uterine tumor is well defined, firm, elastic, preserving its form in all positions of the body.

To hear the fetal heart pulsating and the whirring sound of the uterine souffle or bruit placentaire, the patient must lie on her back, and all disturbing noises, such as watches or clocks, be removed to a distance. The abdomen should be uncovered, and then the stethoscope placed on a line from the umbilicus towards the crest of the ilium, first on one side, then on the other; and it is usually on the left side that we succeed best in discovering the rapid, short, regular, muffled tickings that mark the fetal heart-beat. The number of sounds varies from 120 to 160 in the minute, and the earliest period of pregnancy at which they may be heard is the end of the fourth month. The fetal heart in the female is more rapid than in the male.

The bruit placentaire, or placental murmur, is heard in the second half of pregnancy; it is synchronous with the arterial pulse, and is developed in the dilated uterine arteries at the part where they terminate in the uterine veins.
PART II.
SPECIFIC MEDICATION.

CHAPTER 1.

THE THEORY AND PRACTICE OF SPECIFIC MEDICATION.

It will undoubtedly be conceded that all agents employed as medicine must act either upon function or structure, and that this action to be curative must be opposed to the processes of disease.

If the action of a remedy is to oppose a process of disease, evidently its selection will depend, first, upon a correct knowledge of the disease, and second, upon a correct knowledge of this opposition of remedies to it.

It is a law of the universe that "like causes always produce like effects," or to reverse it, that "like effects always flow from like causes." Therefore, if we can determine the opposition of a remedy to a process of disease in any given case, we have determined it in all like cases. And to make use of this knowledge subsequently it is only necessary that we be able to determine the exact condition of disease, when we very certainly expect to obtain the same curative (opposing) action from the remedy.

In describing this action to another, it is necessary, first, that we so observe and group the signs and symptoms of disease that he may get the exact idea of the pathological condition to be opposed: The skill required is in diagnosis, and necessitates a very thorough re-study of pathology, ignoring to a great extent the ordinary nosology.

Part I of this work will facilitate this study, and serve as a basis for specific or direct medication.

Many persons are in error in regard to our use of the term specific. They think of a specific medicine as one that will cure all cases of a certain disease, according to our present nosology, as pneumonitis, diarrhea, albuminuria, phthisis, etc.; and a person looking at the subject in this light, and guided by his experience in the use of remedies, would say at once there are no specifics.

We use the term specific with relation to definite pathological conditions, and propose to say that certain well determined deviations from the healthy state will always be corrected by certain specific medicines.

A disease, according to our present nosology, may be formed of one or of a half-dozen or more distinct pathological changes, bearing a determinate relation to one another. We do not pro-pose to reach all of these by one remedy, except in those cases in which one lesion is primary and the others result from it. But, on the contrary, we propose a remedy for each pathological feature, using the remedy for that first which is first in the chain of morbid action, and that second which stands second, and so on.

As an example, we analyze a case of fever, and find it to consist of a lesion of the circulation, a lesion of innervation, a lesion of secretion, a lesion of the blood, and a lesion of nutrition; each of these is regarded as a distinct element of the disease, but in the order named-the one depending on the other to a certain extent. A remedy that will rectify the lesion of circulation will sometimes be sufficient to arrest the entire chain of morbid phenomena, as we notice in the simple fevers.

Or a remedy that will correct the lesion of the blood-this being primary and the cause of the various morbid processes will be a specific for all, as when quinine arrests an intermittent or remittent fever.

But in the severer types of disease we find it necessary to use a remedy or remedies for each pathological feature. Thus we employ one to correct the lesion of circulation, one to correct the lesion of innervation, special remedies to increase secretion, to correct the lesion of the blood, etc.

Instead of one remedy to arrest the disease, according to the ordinary use of the term specific, we employ a number of different agents, which are none the less specific, for they meet distinct features of the diseased action.

To employ remedies in this way, it is requisite that we analyze the disease according to what we know of pathology, determining definitely the elements that go to form it, and their relation to one another.

And secondly, that we know the direct influence of remedies upon the human body both in health and disease; that we use them singly or in simple combinations; that we do one thing at a time:
that first which is first, that second which holds the second place, and so on.

But we go yet further into the analysis of diseased action as expressed by symptoms than many suppose. The success of direct medication comes from the definiteness of diagnosis-determining the exact condition of a function or part.

To illustrate, it is not sufficient in selecting a sedative to know that the pulse is frequent, using alike veratrum, aconite, digitalis, gelsemium or ferrum phosphoricum. Frequency is but one element of the lesion, and we have to determine in addition the strength or weakness of the circulation, the degree of obstruction of the capillary circulation, and the condition of the nervous system that controls this function. Thus, where there is strength with frequency we employ veratrum; medium strength with frequency, ferrum phosphoricum; feebleness with frequency, aconite; excitation of the nervous system with strength and frequency, gelsemium; atony of the nervous system and tendency to stasis of blood. aconite and belladonna; feeble impulse from the heart, with capillary obstruction, digitalis, cactus, crataegus, etc.

It is not sufficient to know that the tongue is coated, indicating an impairment or arrest of digestion. We make this secretion give us the history of blood lesions as well as of gastric and intestinal derangements. We learn that pallid mucous membranes with white coat demand alkalies; that deep red mucous membranes and brown coat call for acids; that a dirty-white, pasty coat requires the alkaline sulphites, etc. It is not necessary to continue this illustration further, for the reader will see by the above that specific medication requires specific diagnosis, and that it will be successful just in proportion as we become skilled in this.

It is true that almost anyone can use veratrum and aconite successfully, for the conditions are so prominent that they cannot be mistaken; or anyone may successfully prescribe aconite in sporadic dysentery from cold; ipecac in the diarrhea of children; collinsonia or hamamelis for hemorrhoids; collinsonia for ministers’ sore throat; cactus for heart disease; pulsatilla for nervousness; staphysagria for prostatorrhcea; eryngium aquaticum for cystic or urethral irritation; apocynum cannabinum for dropsy, etc., etc. These remedies have an extra value attached to them because the conditions indicating them are so easily determined.

In specific or direct medication specific diagnosis is an absolute necessity if we are to expect definite curative action from medicines. This is a very important element of specific or direct medication that many physicians do not seem to be able to understand. We must know exactly what the departure from health is, and knowing this we may select a remedy which will correct it. As was remarked in Part I, the physician must have first a thorough knowledge of healthy life, and be able to recognize it or any departure from it. Thus anatomy and physiology are the true basis of direct medication, for if we do not know the healthy structure and function, it is not possible that we can know the diseased structure and function.

We have a very simple rule for measuring the departure from health, and it is easily applied. It is in one of three directions-excess, defect or perversion-above, below, or from. If we can measure disease in this way, the desired remedial action is at once suggested; if in excess it is to be diminished, if defective it is to be increased, if perverted it is to be brought back to the normal standard. In a majority of acute diseases, we will find these departures so clearly marked that the diagnosis and treatment are very easy.

But as there are many elements that go to make healthy life in man, so there are many things that go to make the sum of disease. These will be found in varying combination, yet in most cases there are certain prominent lesions which may be regarded as standing first in the chain of morbid phenomena and upon which the others rest. If we can find remedies which will reach and correct these, the disease is at an end, and the natural restorative power of the body soon gives health.

The most simple form of specific medication is where a single remedy is sufficient to arrest the process of disease, as where we prescribe collinsonia for ministers’ sore throat, drosera for the cough of measles, belladonna for congestive headache, macrotyis for muscular pains, hamamelis for hemorrhoids, phytolacca for mammary irritation, cactus for functional heart disease, staphysagria for prostatorrhcea, etc. This use of remedies gives great satisfaction in the treatment of many diseases, and we are led to wish that the practice of medicine could be resolved into the giving of such specifics.

Not quite so simple, but yet very plain, is the second form of direct medication, illustrated by the following examples: A heavily loaded tongue at base, with a bad taste in the mouth and fullness in the epigastric region, demanding an emetic; a uniformly yellowish coated tongue from base to tip, relieved by podophyllin, kali sulphuricum, calcarea sulphurica, natrium phosphoricum, or leptandrin; a pallid tongue, coated white, calling for a salt of sodium; a pallid large tongue, with a moist, pastycoat,
demanding the alkaline sulphites, say, sulphite of sodium; the deep-red tongue and mucous membranes
with brownish coatings, demanding the use of acids, say muriatic acid.

Quite as plain, but not so easily and directly reached by medicine, is the need of a good
condition of the intestinal canal for digestion and blood making, and associated with it the recognition
of the need of certain restoratives that may be necessary to normal nutrition and functional activity.
These are essentials in the treatment of every form of disease. In acute cases it is required first to rid
our patient of functional disease before we can fully establish digestion and nutrition, but in chronic
disease it will many times stand first, and must always be associated with treatment for local lesions.

A very important part of the management of such cases will be to employ such treatment as
will increase the removal of old and worn-out tissues, and thus relieve the solids and fluids of material
that must necessarily depress functional activity. Remedies that increase excretion are in common use
and form a very important part of our practice. From the earliest periods of medicine the fact that
disease is destructive has been recognized.

Destruction of the material of our bodies necessarily leaves the debris either in solids or fluids,
and experience has shown that it cannot remain in the body with safety. Hence the common use of
those agents that stimulate excretion from the skin, kidneys and bowels. These processes are strictly
vital processes, carried on by delicate organisms under the control of the nervous system.

As they are the basis of life, we may well suppose that nature has guarded them on all sides,
and that they are the true center of life. A man lives because he has the power of renewing his life day
by day. Take away this power and he will die in a brieftime.

When we regard these processes as strictly vital processes, in highly developed organs, under
the control of a most delicately adjusted nervous system, we will be in a position to use remedies to aid
vital action.

Studying the condition of the stomach and intestinal canal in this light, we will see how a direct
stimulant, or tonic, an alkali, an acid, a remedy that will relieve nervous irritation, or one that will give
increased innervation, will in different cases be an aid to digestion. Looking farther, we will see the
necessity, in one case of histogenetic food, in another of calorifacient, in one of iron, in another of
phosphorus, etc. It is just as much specific medication, to be able to select the proper food for the sick
as it is the proper medicine.

We must be thoroughly impressed with the fact that excretion is wholly a vital process, and not
a process of straining; that a secreting organ is continually growing secreting cells, and that these
withdraw from the blood the worn-out materials of our bodies. With these facts fully recognized, we
will be in a position to use remedies with success. Evidently it is possible to so overstimulate or
overwork an excretory organ that this function of cell-production will be very much diminished or
altogether arrested. Just in this proportion must secretion be impaired or wholly arrested.

The best remedies to increase secretion are those that act mildly and stimulate vital function.

Success in the practice of specific medication will be in proportion to the physician's acuteness
of observation and knowledge of remedies. But beyond this we have a field that requires a very
thorough knowledge of vital processes, accurate observation, and an extended knowledge of remedies.
We study not so much the grosser manifestations of disease, but the more delicate shad-ings and
combinations, and our therapeutics require that we have a most intimate knowledge of the influence of
remedies upon the human body. In this field of study the physician will find a beauty and certainty in
the practice of medicine that will give zest to investigation, and as it is pursued he will find greater and
greater success.

We may lay it down as an axiom from which it is never safe to depart, that no medicine should
be given unless the pathological condition and the indications for its use are clearly defined. It is much
better to employ a Placebo than run the risk of doing harm by medication.

Good nursing is an essential element in the successful practice of medicine, and always
requires direction by the physician; keeping the stomach in good condition for the reception of food
and medicine, is of first importance and requires attention. Following this is the selection of proper
food, its preparation and the time for its administration. These alone very well repay the careful
attention and thought of the physician, even if he cannot see an indication for the employment of
remedies.

We make an analysis of the disease and divide it into its component parts before making a
prescription of medicine. There are certain basic functions or conditions upon which all others rest, and
which are essential to life. These demand our first consideration. Thus the circulation of the blood, the
temperature, the condition of the nervous system, waste, excretion, the condition of the blood, blood-
making, and nutrition, are examined separately. Determining the lesion of these, we prescribe such
remedy as antagonizes it and brings the function toward the healthy standard. Some one of them will
stand first in the series of pathological changes, and will serve as a basis for others, and this will receive first attention. We thus prescribe first for that lesion which is first in the chain of morbid action. Then maintaining the influence obtained by a continuation of the remedy, we do that second which is second, and that third which is third, and so on.

In the cure of disease time is an important element, and it is never best to be in a hurry. As a rule, the more severe the disease the slower will be its development, and the slower the departure from health the greater will be the impairment of function and structure.

The manifestations of life in man are from a highly developed organism, the perfection of which is a work of time. Every manifestation of life necessitates a continued renewal of structure, requiring an expenditure of that force we know as vital.

Therefore, when the manifestations of life are abnormal (disease), we must necessarily allow time for the development of the organism.

Usually it is best to change the manifestations of diseased life slowly, giving sufficient time for the organism to adapt itself to the change, and gain increased strength as it returns to the condition of health. It will never do to suppress a process of disease at the risk of suppressing the organism upon which the natural function depends.

It has also been found wise to effect these changes insensibly, or without shock to an organ or to the entire body. In this, as in all other things, it is the slow but continued application of an opposing force that accomplishes the greatest results. Many thousands of sick have been hurried to their graves by large doses of powerful sedatives, administered by "physicians in their efforts to quickly lower the temperature.

Remedies should be employed singly, or in simple combination of remedies acting in the same way. The reasons for this rule are obvious. It prevents random or scattering prescriptions. The dose should be the smallest quantity that will produce the desired result. The proper dose, or that which gives the best result, is very much smaller than one who has been used to the large doses of indirect medicine would suppose possible.

It is difficult to decide just what the dose of a given medicine should be, but it is believed that the doses named in connection with remedies contained in this work are such as will prove the most efficient. The dose will, however, vary in different cases and with different practitioners. If it falls below the gross or poisonous action of the drug, it will have specific influence, and the diagnosis being right, will accomplish the object of the prescriber. Possibly the size of the dose does not make such difference as has been thought, and that the essential element of success is to get the right remedy.

In acute, and most chronic diseases, the examination and treatment should take the following order: (1) With reference to the condition of the stomach and intestinal canal-bringing them to as nearly a normal condition as possible, that remedies may be kindly received and appropriated, and that sufficient food may be taken and digested. (2) With reference to the circulation of the blood and the temperature-obtaining a normal circulation as regards frequency and freedom, and a temperature near 98° as can possibly be secured without the use of depressants. (3) With reference to the presence of a zymotic poison or other cause of disease, which may be neutralized, antagonized or removed. (4) With reference to the condition of the nervous system-giving good innervation. (5) With reference to the processes of waste and excretion—that the worn-out or enfeebled material may be broken down and speedily removed from the body. (6) With reference to blood-making and repair that proper material be furnished for the building of tissue, and that the processes of nutrition are normally conducted.

These are general outlines for the study of disease and the action of remedies in antagonizing it, and may aid in giving direction to our study and enable each one to make a classification of remedies for himself. A brief consideration of each one, with examples of the application of remedies, though it will be a repetition, may be of advantage to the student.

1. The condition of the stomach is of first importance in the treatment of disease. It must be in such condition that it will receive remedies kindly, and permit their speedy absorption, in order that they give us the desired results. Surely, it is not difficult to see the necessity of this, if we take no further view than to obtain the curative action of remedies. If the stomach does not receive a remedy kindly, is irritated by it, we cannot expect ready absorption or the complete curative action. If the stomach throws out its juices, which digest or decompose a remedy, we cannot expect its curative action. If the stomach is sereting mucus in large quantity, if it is in that condition in which it is but a receptacle or retainer, then we cannot expect the ready absorption of remedies, and will not get their curative action.

We are accustomed to specify two conditions of the stomach which may be tolerably easily determined by constant symptoms, and which should always be corrected. These are:
(a) Irritation of the stomach, marked by a reddened (bright) tongue, elongated and pointed, with sometimes reddened and erect papillae. It is accompanied with unpleasant sensations of constriction, and tenderness on pressure over the epigastrium. There may be nausea, retching or vomiting; and in the severer cases, when prolonged, an irritation of the sympathetic, and finally of the spinal and cerebral nervous systems. Its treatment takes precedence of everything else, for until removed we cannot expect the kindly or definite action of remedies. The remedies employed for its removal are: Minute doses of aconite; small doses of ipecac or hydrocyanic acid, or, better, a preparation of the bark of the peach tree. Rhubarb and bismuth are also often useful. These may be aided by the external use of a small amount of libradol, hot fomentations, or rubefacient application, and sometimes an enema to remove the torpor of the lower bowel.

But the reader may ask, "Why, if remedies are specific, name so many for the relief of so simple a pathological condition as gastric irritation?" The question is pertinent, and we will endeavor to answer it. Each of these remedies has a direct action in this condition, and each may be relied upon as a remedy. We choose the remedy, however, with reference to the association of diseased action, and in some cases one will be found best, in others another.

(b) The atonic stomach, with increased secretion of mucus, and sometimes with considerable accumulations. It is marked by the broad tongue, heavily coated at its base, bad taste in the mouth, and feeling of weight and heaviness in the epigastrium. The symptoms are distinct and cannot be mistaken.

When the condition is pronounced, in severer forms of disease, there is no means which will reach it so directly and speedily as an emetic. It needs to be prompt and thorough in action, not producing debility or leaving the organ irritable. It is better, however, unless they are absolutely necessary, to avoid emetics, for, as a rule, patients object to them. If the case is not severe enough to require an emetic, we may accomplish the same object by the use of the alkaline sulphites followed by nux vomica.

We have many minor lesions that cannot be classified under these, to which we will find single remedies specific. Thus in simple nausea and vomiting, without irritation, we prescribe nux vomica; in typhoid disease, with tumid mucous tissues, the baptisia; increased mucous secretion with irritability, minute doses of morphine (one-half grain to four ounces of water, given in teaspoonful doses as needed); imperfect gastric secretion, hydrastis; increased mucous secretion with impaired functional activity, minute doses of podophyllin, etc.

2. We recognize the fact that just in proportion to the variation of the circulation and temperature from the normal standard is the severity and activity of disease. The more frequent the pulse and the higher the temperature, the more active a zymotic poison, the more rapid the progress of local or general disease, and the less able the body to protect itself or expel the cause of disease. The rule here is absolute and there is no variation from it. In therapeutics we find that just in proportion as the circulation and temperature can be brought to (by means which are not depressant and maintained at the normal standard, just in that proportion are the processes of disease arrested and vital processes re-established.

If we take as an example a case of fever, we will find that remedies that will reduce the pulse to a normal frequency, giving freedom to the circulation, will reduce the temperature, and that just in proportion as this is accomplished the febrile symptoms disappear and the various vital functions are re-established. If we can maintain the circulation and temperature at this point without the use of depressants the fever must certainly cease.

In acute inflammation the rapidity of the local disease and destruction of tissue are in the ratio of frequency of pulse and increase of temperature. Just in proportion as we get a normal circulation with reference to frequency and freedom and diminished temperature, just in that proportion the inflammatory process is arrested.

In asthenic inflammation we find another element in the pathology of the disease—a want of vital power, either in whole or in part. This must be antagonized by appropriate remedies. In others there is a zymotic or animal poison which must be antagonized, destroyed or removed. In chronic disease the law is just as absolute as in the acute.

In disease of function or structure, with a pulse maintained constantly above 100 beats per minute, and a temperature above 100°, the patient must die. The disease, as a general rule, will run its course rapidly to a fatal termination just in proportion to the extent of this deviation.

Recovery from chronic disease never takes place until the circulation and temperature approximate a normal standard. In any given case the probabilities of cure are as the possibility of bringing and maintaining the circulation and temperature at the standard of health. The first evidences of amendment are announced by a diminution of frequency of pulse and a better circulation of blood,
and by an equal temperature of the body, approximating 98°.

In very many cases the lesion of circulation is a basic lesion, upon which others arise and are continued. When this is the case the remedy that gives us normal circulation removes all the diseased processes which rest upon it. Thus we will find that arrest of secretion and excretion, lesions of innervation, of waste and nutrition, as well as the intensity of zymotic causes, are in proportion to the rapidity of the circulation.

Conversely, as the pulse comes down to the normal standard, and the blood circulates freely, just in that proportion we have a restoration of the secretions and excretions, better innervation, better digestion and blood-making, and a more active waste and repair.

We have remedies that influence the circulation directly, giving a free and equal circulation, but they are active poisons in large doses, and death occurs in all by cardiac syncope. In the cases of veratrum, digitalis, lobelia and gelsemium, slowness of pulse is a prominent symptom of the poisonous action. In the case of aconite extreme frequency of pulse is produced by the poisonous action.

In medicinal doses (small) the influence of these remedies is that of a cardiac stimulant, and is undoubtedly through the sympathetic system of nerves, which controls the entire circulation of the blood—not only the action of the heart, but of all the blood-vessels to the most minute capillary. This influence removes obstruction to the free circulation of the blood, as well as gives power to the heart and muscular fiber of arteries. As obstruction to free circulation is removed it requires less effort to move the blood; as the power of moving the blood is increased there is less necessity of frequency of contraction upon the part of the heart.

As a rule, the time required to effect sedation will bear a distinct relation to the time required for the development of disease and its average duration. Thus in an acute fever or inflammation from cold the influence of the sedative may be promptly obtained and the disease speedily arrested. In continued fever the accession of the disease (in most cases) is slow in proportion to its duration and severity. Here there are grave lesions of function, possibly of structure, and we expect to obtain the influence of the sedative slowly.

Whilst each of the remedies named as arterial sedatives, aconite, veratrum, digitalis, gelsemium, lobelia, exert a direct influence in this direction, they are not equally valuable in all cases. The first two are pre-eminently the sedatives, their action being more definite and stronger and adapted to a larger number of cases. The special adaptation of each to special forms of diseased action is named in the description of the remedy.

The temperature bears such a constant relation to the frequency of pulse and general condition of the circulation that a remedy which will correct the one will usually correct the other. Thus we find in practice that just as we bring the pulse, to the normal standard by the use of an arterial sedative, in the same degree we reduce the temperature. This is the case in chronic as well as in acute disease. For instance, in a case of phthisis we find a temperature of 101° associated with a pulse above 100 beats per minute; if it is possible to bring the pulse down to 80 the temperature comes down to 98° and a fraction. If this can be maintained without the use of depressants, we find a cessation of tubercular deposit and a reparative process set up in the lungs.

3. The field of therapeutics embraced in our third proposition is very large, and will well repay careful study. The presence of such blood poison as is referred to in this proposition is readily detected, and we have advanced so far in our knowledge of remedies that in many cases we can select the antidote with much certainty. We do not wish to be understood as claiming that we have any remedies that will immediately unite with all of a zymotic poison in the blood, destroy it, and at once restore health. Such an influence could not reasonably be expected. But we have remedies which, introduced into the blood, will antagonize the zymotic poison as it comes in contact with it, arresting its septic influence or wholly destroying it. In some cases they act rapidly, in others slowly, but in all, if properly selected, with great certainty.

The principal remedies of this class are the alkaline sulphites (sulphite of sodium being in most common use) and the mineral acids. The rules for the selection of the one or (he other of these are quite simple and very definite:

In any given case presenting a pallid tongue, with white or dirty-white, pasty coating, use the alkaline sulphites. In any given case presenting a deep-red tongue with brownish coatings, or deep-red glossy tongue and dark sordes, use mineral acids. In some cases we employ sulphurous acid, but in the majority muriatic acid.

Of our indigenous materia medica we have two remedies that markedly possess these properties, and they possess them in a high degree. These remedies are echinacea angustifolia and
baptisia tinctoria, and they may be useful in either of the cases named.

Prof. J. M. Scudder, in his "Specific Medication," speaks of acids and alkalies as follows:

"There is a specific use for acids in the treatment of disease, which we wish to study carefully. In any form of disease we may have an excess of the alkaline salts of the blood. This maybe the basis of diseased action, or but a complication rendering it more intense, but whether the one or the other, it needs to be recognized and have direct treatment.

"The indications of excessive alkalinity are very plain and need not be mistaken by the youngest practitioner. The color of the mucous membranes is deep red, especially of mouth and tongue; the coating of tongue, sordes, or any exudative material, has a dark color, usually brownish. It makes no difference what the diseased action is, in its totality, or what it is called, the deep red, somewhat dusky color, always demands the administration of acids.

"There is but one exception to this, and that is a rare one, in which the excess is of sodium, but with a defect of potassium. In this case the administration of a salt of potassium will answer a better purpose than the acid, or may be combined with it.

"Muriatic acid is preferable in most acute cases, and should be used so diluted, and in such quantity, as to be pleasant to the patient, and until the indication for its use is removed. Lactic acid is sometimes preferable with children, and in some cases of chronic disease, especially when associated with indigestion. The vegetable acids may be used in acute disease, but are not so good as those named.

"It is well to consider the specific use of alkalies in this relation, as they are the opposite of acids. We may say of these, as of acids, that their deficiency is found as a constituent element in all forms of disease, in some cases being the basis of a morbid action, in others but a complication, but, whenever found, an important element and demanding direct treatment.

"The symptoms of deficiency of these salts of the blood are very plain. The tongue is pallid and broad, its coating pasty and white or yellowish-white. The mucous membranes are uniformly pallid. As these evidences are absolute and readily determined, it is not necessary to name others not so constant.

"Whenever we find this deficiency of the alkaline salts we will observe, as the result, loss of power in the stomach, enfeebled digestion and slow absorption, impairment of the circulation, arrest of nutrition and waste, and enfeebled innervation. These will correspond in degree to the deficiency.

"So marked are these results that I have long regarded the diagnosis, with regard to excess or deficiency of the alkaline salts, as of the highest importance. Indeed, in some forms of disease, especially of a typhoid character, it is the principal element upon which a successful treatment is based.

"Sodium is the natural salt of the blood, and exists in the body in the largest proportion. Whenever, therefore, we have the evidence of deficiency of the alkaline salts, and no special symptoms indicating others, we will give a salt of sodium. In many cases I order bicarbonate of sodium. "If at the same time we wish an antiseptic influence we may give the sulphite or hypo-sulphite of sodium or the chloride of sodium.

"I am satisfied that I have seen patients die from deprivation of common salt during a protracted illness. It is a common impression that the food for the sick should not be seasoned, and whatever slop may be given, it is almost innocent of this essential of life. In the milk diet that I recommend in sickness common salt is used freely, the milk being boiled and given hot. And if the patient cannot take the usual quantity in his food I have it given in his drink. This matter is so important that it cannot be repeated too often or dwelt upon too long.

"The most marked example of this want of common salt I have ever noticed has been in surgical disease, especially in open wounds. Without a supply of salt the tongue would become broad, pallid, puffy, with a tenacious pasty coat, the effusion at the point of injury serous, with an unpleasant watery pus, which at last became a mere sanies or ichor. A few days of a free allowance of salt would change all this, and the patient would get along well.

"A salt of potassium is indicated where there is feebleness of the muscles to a greater extent than can be accounted for by the disease. Occasionally such want is expressed in a marked manner by feebleness of the heart.

"Ammonium will occasionally prove the best salt for temporary use, especially where there is great debility. But when so used it should be followed by the free use of common salt or some salt of sodium."

The reader will bear in mind that the activity of a zymotic poison is in exact proportion to the departure from normal function. With a rapid pulse, high temperature, and arrest of secretion, its development is rapid and its devitalizing influence marked. Or in the rare opposite cases of congestive intermittent fever and cholera, as the circulation is enfeebled and the temperature low-ered its progress is rapid.

Hence, in order to antagonize a zymotic process, it is necessary, so far as possible, to obtain a
normal circulation and temperature. This proposition cannot be too strongly insisted upon. In a given case, the circulation and temperature being favorably influenced by aconite, ferrum phosphoricum or veratrum, sulphite of sodium exerts an immediate and marked controlling influence over the fever poison. Whilst if it had been given without such preparation it would have had no influence at all, or but slight influence.

Some causes of disease are destroyed and removed by remedies that increase waste and excretion. Preparations of potassium and sodium, especially the alkaline diuretics, act in this way. There are some organic remedies that exert a direct influence upon causes of disease, modifying or destroying them, as may be instanced in the action of phytolacca in diphtheria. This action, however, in the majority of cases is feeble.

Causes of disease acting in and from the blood are frequently removed by stimulating the excretory organs. Some are removed principally by the skin, others by the bowels, and others by the kidneys. The cause of periodic disease plays a very important part in the diseases of some localities. Antagonize this cause and the disease ceases, or at least is very much modified. Quinine is a true specific, and may be taken as the type of these remedies. If the diagnosis is correctly made, and the system prepared for its administration, it will rarely fail, even when given in a single sufficient dose.

4. The human body is a complex structure, united in functional activity by a nervous system. As this exerts a controlling influence, its lesions form a very important element of the study of pathology. It is a wide field for study, and its cultivation will greatly advance medical science. Those functions which we have been accustomed to speak of as vegetative, are associated together, and to some extent governed by the ganglionic or sympathetic nervous system. It comprises digestion, blood-making, the circulation of the blood, nutrition, and secretion and excretion. These are the essentially vital functions, in the performance of which man has life. If they are properly performed, he has healthy life; if there is an aberration in either of them, one or more, he has diseased life.

Control and association of these vital processes being in the ganglionic system of nerves, we would naturally expect it to furnish the readiest means of reaching them and correcting their lesions. If there are remedies, then, that influence the ganglionic nerves directly, and through them the vital processes of the body, they must become our most direct and important therapeutic means. It is in this way that a large number of specific remedies act. The sedatives, aconite, ferrum phosphoricum, veratrum, gelsemium, and others, such as crataegus, cactus, belladonna, eryngium, phytolacca, hamamelis and pulsatilla, certainly produce their effects through it.

The association of the spinal cord with the sympathetic brings vital functions in relation with our conscious life, and through its superior expansion, the brain, adds suffering from disease. Conversely, mal-conditions of conscious life are reflected through this association and influence vital processes. It is, therefore, important to reach lesions of the vegetative life directly through the ganglionic system of nerves, and it is also desirable to control any disease producing an influence that might be extended from the cerebro-spinal centers.

5. Lesions of waste and excretion are elements of every disease. In some they form a principal part, in others in less degree, but in all they require to be estimated in diagnosis and therapeutics. They range themselves under the common classification of excess, defect, and perversion, and usually it is not difficult to determine their character and select means that exert a direct influence.

Constant waste is a necessity of life, as is constant removal of this waste. If the materials of the body are not broken down and removed as they have served their purpose, the body is old, imperfect, and has lost functional power to this extent.

If the material is broken down and removed to the blood, but not carried out by the excretions, we will have an impairment of life from its presence in the blood.

Too rapid waste of tissue is sometimes an important element of disease, requiring care in diagnosis and the application of remedies. A perversion in waste and excretion is a common element of disease. In the breaking down of a protein body it passes through many phases, and in its metamorphosis it assumes forms that are noxious to life, if they have any degree of permanency or are in any considerable quantity. Lesions in retrograde metamorphosis are therefore to be estimated, and remedies which influence it become important.

Many causes of disease act in and from the blood. They are zymotic poisons, or animal matter undergoing change, and influence the blood and life in different degree, in proportion to their quantity, and especially in proportion to their activity in setting up the septic process. These may be antagonized or destroyed in many cases; in others the natural process of retrograde metamorphosis is stimulated, and they are transformed into urea and other innocuous bodies fitted for excretion by kidneys, skin and bowels. Means that increase the activity of these excretions are frequently sufficient.
for the removal of such causes of disease.

6. The necessity of regarding the nutritive processes during the progress of disease is now
admitted by all physicians. The condition of the stomach and digestive apparatus is of first importance
in all forms of disease, and its lesions demand first attention in our therapeutics. This is essential to the
successful administration of remedies and the appropriation of proper food.

The object is to place the digestive organs in good condition to receive and prepare food for
admission to the blood; to furnish such material to the blood as may be necessary for its perfect
organization, and for the renewal of tissue.

The first lesson in specific therapeutics is to learn that remedies are selective, and that when
introduced into the circulation through the stomach they especially influence certain parts and
functions, and that this action is unvarying. If we desire to influence the circulation of the blood we
select a remedy that acts upon the circulatory system, and not one that acts upon other parts. The
remedy should be selected with regard to the character of the lesion; if in excess, a remedy that will
bring it down; if defective, a remedy that will bring it up; if perverted, a remedy that will correct the
perversion. This cannot be called theorizing; it is clearly demonstrable in its premises and conclusions.

The second lesson in specific diagnosis and specific therapeutics is to determine the relative
importance of these lesions. We want to know which stands first and serves as a basis—we might
properly call this the basic lesion—and then the relative importance of others which have grown upon
it. For instance, many simple fevers and inflammations have as a basic lesion the disturbance of the
circulation and the increase of temperature; arrest of secretion, loss of appetite, digestion and nutrition,
deprivation of the blood and derangement of innervation are based upon them. The disease may really
be a very active and severe one, and yet rest so wholly upon the lesion of circulation that if this is
corrected they all fade away and the patient rapidly convalesces. The special sedative, associated
with the proper bath, becomes in these cases absolutely curative. We find cases, however, in which the
lesions of circulation and temperature are quite as marked, and yet the sedative is not curative; in some
cases, indeed, it is not sedative even. Let us take two very common cases illustrative of this:

A typical malarial fever gives us quite as frequent a pulse and exalted a temperature as in the
case where the sedative alone was curative, but now we find it only preparative—the lesion of the blood
is the basic lesion. We prepare the patient for the use of quinine, or in some cases give it alone, and the
quinine is curative.

Again, a patient is suffering with acute fever or inflammation, the pulse quite as frequent, the
temperature as high, and yet the sedative has no more influence than so much water, unless it be to
irritate the stomach. Here the lesion of the circulation and temperature is not the basic lesion. Suppose
we examine the tongue and find it pallid with white coat, we say at once here is a lesion of the blood, a
salt of sodium is required. We give it, and now the sedative acts kindly, or indeed it may not be
necessary, simple bicarbonate of sodium lessening the frequency of the pulse more markedly than
veratrum.

We find the same is the case where the symptoms point to the alkaline sulphites, muriatic acid,
sulphurous acid, chlorate of potassium, phosphorus, iron, copper or natrium sulphuricum. If, for
instance, in an endemic of typhoid fever, we find deep redness of mucous membranes, this being
characteristic of the basic lesion—a want of acid—we find that muriatic acid becomes sedative, stim-
ulant, restorative, increases secretion, checks diarrhea, stops delirium, indeed does all for the patient
that we can wish. Most titles we supplement it with other remedies acting in these directions (such as
echinacea and baptisia), but occasionally it is safest to trust to the acid alone.

Again, we find cases where the predominant affection is of the nervous system. For instance,
the face is flushed, eyes bright, pupils contracted, increased heat of scalp, restless and sleepless,
determination of blood to brain—gelsemium becomes our best sedative. Why? Because it quiets the
irritation of the brain, and removes this, which is the basic lesion. So it is in the opposite condition—
enfeebled capillary circulation and tendency to congestion of the cerebro-spinal centers. The pulse may
be quite as frequent, the temperature as high, secretions arrested, blood poisoning rapid, and yet
sedatives are not sedative. Why? Because there is an underlying lesion.

We must influence the vegetative system of nerves first, to restore capillary circulation, and
then our other remedies act kindly.

This needed influence can be secured by the administration of small doses of belladonna. Our
methods of diagnosis in obscure cases will be found in the following brief statement:

1. We have direct symptoms pointing to the seat and the character of the disease. In simple
cases these symptoms are clear and distinctive; in obscure cases they are not, but they point the
direction of investigation. If we have a single characteristc symptom, one that we have called basic,
then, of course, our diagnosis is complete and the treatment definite.
2. By differential diagnosis we undertake to determine the location and character of disease by
an analysis of the symptoms, seeing which of them are common to all of the supposed affections-
which are undeniably special to a certain part or function—until we have found one or more that locate
the disease and determine its character.

3. By exclusion we give the entire body an examination, determining the functions that are
rightly performed, excluding these, until finally we have localized the lesion and have determined its
character.

There is hardly a disease so obscure but that it may be accurately determined in this way, if
proper care is used. Necessarily we must know our anatomy and physiology and the modern teachings
of pathologists, then with caution and a right use of reason we can hardly fail.

Now, if we have determined such obscure disease, and we have had no experience and can find
no treatment in our books, how shall we proceed? Very certainly as follows:
A drug is a remedy because it influences the part or function diseased. It is an indirect remedy when its
influence is dependent upon the disturbance of some other part or function; it is a direct remedy when
its influence is directly upon the part.

Now we have determined the functions that are changed, and the part affected, we think of
those remedies which are known to exert a more or less direct influence on the particular part or
function; knowing the character of their action, and the want of the diseased body, we adapt the one to
the other. If the case is one new to us we may have to experiment, but the line of experiment will be a
rational one and likely to lead to good results.

CHAPTER II.

THE STUDY OF THERAPEUTICS.

In pursuing this study it will be well to constantly bear in mind: (1) That causes of disease act
upon a living body, and that such action invariably impairs its life. (2) That causes of disease must be
removed whenever it is possible to accomplish such removal without still further impairment of life.
(3) That disease itself is a wrong in the life of the individual, and that it is as much a part of him as is
healthy life at other times. (4) That disease is opposed by remedies which influence the organism
toward a healthy or right performance of functions. (5) That remedies may be divided into two classes,
namely, those which remove causes of disease, and those which restore vital processes.

In studying an individual drug we should secure such facts as we can obtain from published
works and other sources in regard to it, and arrange them in accordance with the above classification—
those which remove causes and those which restore vital processes. The mind very soon learns to
separate them, and without our volition decide upon the merits of all statements made in regard to the
remedy being studied.

As the process of analysis goes on, the mind not only discusses probabilities, but wants to know
how the results have been obtained. In the case of a remedy proposing to remove causes of diseases, it
wants to know how it is done.

Is it a chemical influence, combining with and neutralizing the cause, or does it extract it, as in
pulling a thorn, removing a decayed tooth or a sequestrum, or is some organism forced to its removal,
as when we produce emesis, catharsis, diaphoresis, diuresis, increased combustion, etc.?

The study of therapeutics in this way soon vastly increases one's knowledge of the action of
drugs. In many cases things that had been accepted as true lose their basis and are rejected, while other
and more rational views take their place. We begin this study by gathering together the materials at our
disposal, analyze and weigh them as indicated above, and reach certain conclusions from the premises.
We bring all our previous experience in therapeutics to aid us, and proceed to prove the truth of our
conclusions by direct experiment.

The course of experimentation must vary in different cases, must, indeed, be varied in order to
reach definite results, and in all cases must be conducted with care. We cannot jump at conclusions
here. We are dealing with a living body and one which possesses recuperative power in an eminent
degree. We should be making very great mistakes if we regarded everything that followed the
administration of a drug as its direct result, and yet we are constantly in danger of making such
mistakes. The judicial mind is an important element of success. Without prejudice we must weigh the
evidence and compare it with our past experience and our present physiological and pathological
knowledge.

It is well to know how remedies act—at least to a certain extent. We want to know whether the
action of a remedy is topical or from the blood; and whether it is directly upon the affected part, or
indirectly through its action upon other parts or functions. It is well also to know whether it influences
the life directly by its influence upon the body, or indirectly by the body's action upon it for removal—
whether in the present condition the remedy is an advantage to the life, or a toxic agent. The questions
also arise: Is the action chemical? physical? vital? The simple proposition, "disease is a departure from health," is followed by the pathological question, "in what direction is this departure?" and this by the therapeutic conclusion that a remedy is that which, "opposing" such departure) brings the part or function to a healthy standard.

We want to know the action of drugs in medicinal doses upon the human body, not only so far as this action is elective for different parts, but also as to its kind. If a drug is elective for the apparatus of circulation, innervation, digestion, nutrition, etc., we think of it as among the possible remedies in disease of these parts and functions. If it is elective for brain, spinal cord, lungs, stomach, bowels, kidneys, skin, serous membranes, mucous membranes, etc., we think of it as a possible remedy in diseases of these parts. In direct or specific medication it is a first requisite that the drug influence the part or function which is diseased.

Secondly, we want to know the kind of action. What is the result of the administration of a drug? Is it excitant or depressant? Does it favor an increased circulation, innervation, functional activity, or lessen circulation, innervation or functional activity?

In prescribing for disease the questions come: What drugs will influence the particular part? What drugs will influence it in the direction of health? Disease is wrong life, the action of the drug is opposed to this, and looks to right life.

We propose to study the action of remedies on the living man, both healthy and diseased, as an important means of determining their action and use. Drugs influence the life-must of necessity influence it to be remedies. They influence the life in health as well as in disease, though this influence may not be so marked, owing to the greater power of resistance.

In health the influence of a drug is of necessity disease-producing, for every departure from the healthy standard is disease. If we want to know the elective affinity of drugs for parts and functions, we may give the drug to the healthy person. If we want to know the kind of action, we may use the drug in health. If we want to know the curative action of drugs, we are obliged to test them in disease, though the action may have been pointed out by physiological proving.

The method of "proving" is simple. The prover needs be in good health, and during the proving he should be careful that no outside or unusual circumstances are permitted to influence the action of the drug. If a topical action is wanted, we use it in such form that absorption will be slow. If an action from the blood is wanted, the drug must be so prepared that its absorption will be speedy and with little topical action. It is well in some cases to use it by hypodermic injection, or obtain its endermic absorption.

The drug may be taken in the usual dose of old medicine at first. The mind must be entirely free from prejudice, and no anticipation of the kind or situation of action indulged in. Say, for instance, we take podophyllum, finely powdered, grs. v. to x. in the morning on arising. We notice, first, an unpleasant sensation in the stomach, and our morning meal is troublesome, with a sense of fullness and weight. Following this is an unpleasant taste in the mouth, with gustatory sense impaired; saliva is increased in quantity, and is more tenacious; mucous secretion more abundant; tissue of mucous membrane is fuller, especially marked in tongue; slimy yellowish fur on tongue; fauces tumid.

Then comes uneasiness in hypogastric region, with sense of fullness and need of stool; fullness and weight in region of bladder, and disposition to pass urine. And during the day a sense of weight in basilar brain, with some dizziness and loss of perfect command over the muscles. There will also be a change in the pulse, usually accelerated; increased temperature, 99° to 100°, and some change in the skin. Finally, if the medicine has sufficient influence, a stool which is changed in character.

This shows the localized influence of the drug, and the kind of influence in toxic dose, and will aid in pointing out the probable curative action. We take podophyllum because it is a drug with which many physicians are quite familiar, and in many cases have experienced its effects in their own person, and not because it is a good example of the advantage of physiological proving.

Attention has been called to the fact that dose is an important element in therapeutics, and especially to the fact that many drugs exert a directly opposite influence in large and small doses. If this is ascertained with reference to any drug, then the therapeutic indications are plain. If we know the action of the large dose, and its influence upon parts and functions, we conclude that the influence of the small dose is directly opposite.

Again, we find drugs producing some peculiar symptoms which do not form a part of, and are
not recognized in the ordinary nosological classification of disease-symptoms which may be absent or present in many diseases, and still have no seeming reference to their origin, progress or duration. They are peculiar drug symptoms.

Again, we find that certain drugs will prove curative in disease presenting peculiar symptoms, which these drugs will not produce. These symptoms may be absent or present in any disease without seemingly affecting the origin, progress or duration—indeed, seeming to have no relation to the pathological processes. Here the physiological proving gives no information; our knowledge comes from experimentation in disease, and the direction of experiment is an accidental suggestion.

A few illustrations of these methods of study will prove interesting and profitable. They will be selected from the more common remedies, and so described that the reader may add them to his working materia medica. We will take quinine as the first drug, the physiological effects of which, as has been proven by the experience of many other investigators, is correctly given in the following by Pereira:

"Excitement of the vascular system manifested by increased frequency and fullness of pulse and augmented respiration. Furred tongue and other symptoms of a febrile state are also observed.

"Disorder of the cerebro-spinal functions, indicated by headache, giddiness, contracted—in some cases dilated—pupils; disorder of the external senses, agitation; difficulty of performing voluntary acts, somnolency, in some cases delirium, in others stupor.

All fevers, when measured by the thermometer, are periodic; the diurnal variation of temperature in the types called continued ranges from two to four degrees, and the febrile action from quinine poisoning shows every shade from intermittent to continued, and is not usually the typical intermittent.

But the reader will notice that we do not use quinine as a remedy during vascular excitement, except there is a very evident want of a stimulant to the sympathetic and other nerve centers. It is the direct stimulus we want, and it has reference not to the apparent excitement, but to the real depression. The remedy will produce a fever, and it will cure a fever. That it produces a fever shows that its action is directly upon the functions involved in fever; that it cures a fever is because it gives that stimulus necessary to the normal performance of function, and we employ it when such stimulus is necessary. This property called antiperiodic is something we know little about, except so far as we know the facts by experimentation in disease.

Taking ipecacuanha as the second example, we have a very good illustration of the first proposition, that the action of the small is the opposite of the large dose; and knowing the poisonous action we may predicate the curative.

"If the powder or dust of ipecacuanha be applied to the eyes or face, it acts as an irritant, and causes redness and swelling of these parts. Inhaled, it irritates the respiratory passages, and in some cases brings on difficulty of breathing, similar to an attack of spasmodic asthma."

In moderate doses continued for a long time, an irritation of every mucous membrane in the body can be produced by ipecacuanha, in some situations going on to inflammation. In small doses it cures this very condition, and is the remedy for acute inflammation of mucous membrane. Irritation of muscular fiber underlying the mucous membrane is another symptom of its physiological action, and to this also it is a remedy. Not, however, to the irritation of atony, as in the majority of cases of asthma, for here, in place of proving curative, it increases the disease.

Tobacco is another very fair example of this action:—" Its most remarkable effects of languor, feebleness, relaxation of muscles, trembling of the limbs, great anxiety, and tendency to faint. Vision is frequently enfeebled, the ideas confused, the pulse small and weak, the respiration somewhat laborious, the surface cold and clammy, or bathed in a cold sweat." A distressing sensation of sinking at the pit of the stomach is a characteristic symptom. Given these symptoms as a group, or the most characteristic of them, and tobacco is a very certain remedy when given in small doses.

Hyoscyamus is another example, though not quite so marked. Faquier says, "Henbane causes headache, giddiness, dimness of sight, dilatation of pupil, a greater or less tendency to sleep, and painful delirium. In some cases these symptoms are followed by thirst, nausea, griping, and either purging or constipation; and in a few instances febrile heat and irritation of the skin are induced."

Given a case of headache, with giddiness and dimness of sight, and hyoscyamus will prove curative. Given a fever with the same symptoms, and hyoscyamus will prove a valuable remedy.

Taking examples of the second class, those whose action is the same in kind, whether the dose is large or small, we have a large number. We will select those in which the action is not topical, but from the blood.

Jalap is a good example. Its action is that of an excitant to the gastro-intestinal canal in any dose. In large doses it is a painful and drastic purgative; in small doses continued it causes irritation.
Nux vomica is perhaps the best example. In the most minute quantity it is a spinal stimulant, as it is in the largest dose, and the entire range of its use is as a stimulant to the spinal and sympathetic centers. Possibly this assertion may be modified by saying that in small doses the effect is not so much stimulation, as it is the prompting to normal functional activity.

The characteristic symptoms produced in health by nux vomica are of the muscular system, showing its influence on the spinal cord: “A feeling of weight and weakness in the limbs, and increased sensibility to external impressions (of light, sound, touch, and variation of temperature), with depression of spirits and anxiety, are usually the precursory symptoms. The limbs tremble, and a slight sense of rigidity or stiffness is experienced when an attempt is made to put the muscles into action.” Then comes the convulsive action of the voluntary muscles, increasing as the remedy is continued.

The symptoms resulting from nux vomica and which, when met with in disease, are cured by it, are italicized.

But in moderate doses, continued for some time, nux vomica is an excellent example of the third action, producing certain peculiar drug symptoms not readily accounted for by the usual theory of its action. And, which symptoms being found in disease, the drug becomes a remedy.

Thus, if the drug is continued for a length of time, it will in many cases cause an unpleasant colic with pain pointing at the umbilicus; pain in right hypochondria; and in women at the menstrual period a peculiar dysmenorrhea. To these when observed as the result of disease, the nux is curative. It will also give a peculiar sallowness of skin, with relaxation of connective tissue; a large tongue, with yellowish coating; and again, for these in disease, it is a remedy.

If we examine arnica, we find that it "quickens the pulse and respiration, and promotes diaphoresis and diuresis," and shows the properties of a stimulant to the ganglionic nervous system. It is for this purpose we use it in disease, and knowing the action of the drug, we can use it when this stimulant influence is desirable.

"Furthermore, it appears to exert a specific influence over the nervous system, causing headache, giddiness, and disturbed sleep." These are the results of large doses, and due to over-stimulation. When we have a headache, giving a peculiar sore and bruised sensation, with disturbed sleep, we have an excellent indication for arnica, and probably the best there is for the internal use of the remedy.

Returning to our first remarks upon the subject, we find that remedies may be classified into:
(a) Those which remove causes of disease; (b) those which restore vital processes. Taking up the first class, we want to know the influence upon the life of those drugs which remove causes of disease.

We say that morbid accumulation in the stomach is a cause of disease, and it may be best to remove this with an emetic-to be determined by the action of the different emetic agents upon the processes of life, especially the effects subsequent to the act of emesis. Compare apomorphine, tartar-emetite, lobelia, sanguinaria, - apocynum, mustard, common salt and sulphate of zinc as regards the act of emesis and subsequent influence. In a given case of predominant wrong in the stomach by accumulations, we first determine whether this or the drug action will do the greatest wrong to life; and concluding that it is best to effect its removal, we select - that remedy which will accomplish the object with the least expenditure of vital power, leaving the organism in the best condition, or doing anything that needs to be done to restore normal functional activity.

This is an important study, and the method of comparison must lead to a better use of remedies, and, training the mind to accurate thought, it will serve a very important use both in diagnosis and therapeutics.

As we study the gross action of the group emetics, we study the class, cathartics, diaphoretics, diuretics. Here is a series of agents producing alvine dejections, and we wish to determine their use and the individual agent to be employed. We also wish to determine whether the removal of the intestinal accumulations will give sufficient relief to the life to justify the depression which will follow the selected cathartic; that is, will the patient be better with or without the medicine? Then the comparative action of cascara sagrada, podophyllin, magnesia, castor oil, cream of tartar, etc., should be fully considered. We must get our remedies well in hand, and know them individually. We not only want to know the gross action, but the more delicate shades of action; not only the action in health, but also in the varied changes of disease.

We want to know how a remedy influences: First, as regards the difference in dose-its influence in large, medium, small and minute doses. Second, as to location of action-is it general localized, definite? Third, as to kind of action-does it increase, diminish or alter? Fourth, is its action
We find also that some remedies may be classified as they influence special tissues—mucous digestive apparatus, the urinary apparatus, the excretory apparatus—skin, kidneys, bowels—the brain, etc. They readily, others with difficulty. We have remedies that influence the respiratory organs, the nervous system which controls the body, divided into brain, spinal cord and sympathetic, and the bowel system which controls the excretion of waste. The remedy may expend its principal force upon either the one or the other. We have a blood which is the common source of supply, and the common sewer of the whole body. The remedy may influence the apparatus for the removal of waste is also to be taken into account, for we have here sources of general disease. The reader will notice that classification grows more difficult as we progress, and requires thought to make such a classification, and it will cause one to read his books with more care, and recall his experience with remedies more fully, in order to do it satisfactorily.

Every practitioner should devote some of his time to the study of remedies. He may take his materia medica and make a list of the drugs he knows something about, preparatory to a classification. In this classification he may take any statement of the books that his experience has confirmed, but he should not take anything upon the authority alone. Having the group of agents before him, he may classify them himself, and put it in writing, that he may have it before him for revision as his experience grows larger.

His remedies may be first divided into two classes—those which have a general, and those which have a local action. Of course, many remedies will have both a general and local action, but one will be decidedly first and prominent, so that with the majority the classification can be readily made.

It requires thought to make such a classification, and it will cause one to read his books with more care, and recall his experience with remedies more fully, in order to do it satisfactorily. It is true that this work requires time, but it gives an education of the mind that could hardly be obtained otherwise. Having made the foregoing classification, he may say of the action of remedies, both general and local, that they must either increase, diminish or change from the normal standard, and he will then be able to make a second grouping in these classes, and call the drugs excitants, sedatives and alteratives.

As he reads his lists over he is not so certain that the work is well done, and he is likely to say that he will "think about it." That is the very object we have in view, and in "thinking about it" he will learn more about therapeutics than he can possibly learn in any other way. If now we take our group of general remedies, we find that we can make sub-classes, according to the action of the medicines upon different junctions or parts which are general. Thus we have a nervous system which controls the body, divided into brain, spinal cord and sympathetic, and the remedy may expend its principal force upon either the one or the other. We have a blood which is the common source of supply, and the common sewer of the whole body. The remedy may influence the structure of the blood in any of its several parts, or may influence the sewage afloat in it.

Then we have the circulation of the blood, and we may have wrongs of this, which are in frequency, impairment, or irregular distribution. We have a lymphatic system common to the entire body, which may be a source of disease. The apparatus for the removal of waste is also to be taken into the estimate, for we have here sources of general disease. The reader will notice that classification grows more difficult as we progress, and calls for closer study and more thought. But it has this in its favor, that it brings out all we know of medicine, and enables us to classify our own knowledge and that of the books, so as to make them useful. When we study local remedies we find that they may be classified in a similar manner, some of them readily, others with difficulty. We have remedies that influence the respiratory organs, the digestive apparatus, the urinary apparatus, the excretory apparatus—skin, kidneys, bowels—the brain, etc. We find also that some remedies may be classified as they influence special tissues—mucous
membranes, serous membranes, connective tissue, bones, etc. We find that remedies not only have an elective affinity for parts, but their influence is uniform in health and in similar conditions of disease.

While making these classified lists of remedies it would be well to make one of incompatibles, and carefully study their relations to each other.

Simplicity in prescribing will do much toward avoiding the dangers of incompatibility of medicines. When possible, remedies should be prescribed singly. It is better to prescribe in this way, and when more than one remedy is needed, give the medicines in alternation. When combinations are necessary they should consist of as few agents as possible, and a definite indication for each remedy should always be apparent.

The following rules have proven to be of value as a means of refreshing the memory:

- Never use strong mineral acids in combination with other agents; unless you know exactly what reaction will ensue. They decompose salts of the weaker acids and form ethers with alcohol. Never combine free acids with hydrates or carbonates. Do not combine two or more soluble salts.
- The following more or less insoluble salts are formed whenever the materials of which they are composed are brought together in solutions:
  - The hydrates, carbonates, phosphates, borates, arseniates and tannates of most earthy and heavy metals and alkaloids, and the metallic sulphides; the sulphates of calcium, of lead, and of the subsalts of mercury; the chlorides, iodides, and bromides of bismuth, silver, lead, and sub-salts of mercury; the iodides of quinine, morphine and most alkaloids.
  - Alkalies precipitate the alkaloids and the soluble non-alkaline metallic salts, and (as also metallic hydrates and carbonates) neutralize free acids.
  - Silver nitrate, lead acetate, corrosive sublimate and potassium iodide should, in almost all cases, be prescribed alone. The first with creasote forms an explosive compound.
  - Aconite should never be given in any vehicle except water. Silver nitrate and lead acetate and subacetate are incompatible with almost every thing, but they may be combined with opium. The subacetate of lead with opium forms an insoluble compound, but the compound is active as a lotion. Tannic acid and substances containing it are incompatible with albumin and gelatin. Tannic acid, iodine and the soluble iodides are incompatible with the alkaloids and substances containing them, and with most soluble metallic salts. Vegetable infusions are generally incompatible with metallic salts.
  - Explosions result from the combination of powerful oxidizers with readily oxidizable substances, as potassium chloride or potassium permanganate with tannin, sugar, sulphur, sulphides, vegetable powders, glycerine, alcohol, tinctures or ether.

The chlorate of potassium must never be associated with any organic substance; it is decomposed easily by a slight elevation of temperature, giving off its oxygen to the organic matter, which is made up of carbon, hydrogen, oxygen, and sometimes nitrogen, and forms products of oxidation, with a setting free of such an amount of heat that the mixture may be hurled, together with the vessel that contains it, in the face of the person who is so thoughtless or ignorant as to attempt the preparation of so dangerous a combination. Not only does the chlorate of potassium give explosive mixtures with organic substances, but it has the same effect when combined with the hypophosphites of lime, nitrates, and the salts of iron.

Every precaution expressed about the chlorate of potassium is equally applicable to the permanganate of potassium. The association of iodine with a liquid containing large quantities of ammonium will result in the formation of an explosive mixture. Iodine combined with the yellow oxide of mercury and Vaseline might serve as an eye salve if the man attempting its preparation was not blown up before completing the labor. Violent explosions have resulted from mixing iodine with essences.

Chromic acid is such an energetic oxidizer that it should only be used in crystals or dissolved in water. Bromine should never be combined with either alcohol or oil, and nitric acid should not be prescribed with organic compounds. The facts here given show in a measure the importance of handling the most common drugs with the utmost caution.

The first study of remedies is a study that recalls and fixes that which we know, and that
gathers from books the essential facts or what seems to us essential facts of drug action. It is work, but the physician comes out of it stronger in mind and very much better able to prescribe for disease. There are some things which can only be learned by experiment, and everyone should make some effort in this direction.

You have your own bodies, and though you may value them highly, it will do little harm to test some medicines upon your own person. One can also, occasionally, persuade a friend to take a part in testing a remedy. Very certainly, if the physician has occasion to take medicine for any disease, he should carefully note its effects from hour to hour. Let us call this the second method of studying remedies. It is the homeopathic method, though employed to some extent by all classes of physicians. It gives most excellent and reliable results, and we cannot afford to dispense with it.

The third method is by carefully studying the effects of remedies administered for disease. This study can only be made to advantage where notes are kept, when care is used in the diagnosis, and when single remedies, or remedies that act in the same way, are employed. It is true that we can carry something in our memories, and by repeated observations facts will become familiar, but it is not a good plan to trust the memory too far.

There are two things we want to know—the expression of disease, and the action of remedies—and, in so far as we can, we want to associate them together. We may keep a record of cases with but little writing, if we have a plan to commence with. One word will sometimes express the condition of disease; it will rarely require more than a line. We write of one fever; to another we prefix the word intermittent, remittent, continued, typhoid; or it may be variola, rubeola, scarlatina; or catarrh, laryngitis, pneumonitis, enteritis, phrenitis, etc. We have a whole history of the common progress of a disease in a word or two. Now when giving medicines we may note nearly as briefly the reason why we have selected the remedy: Pulse small, frequent—aconite; pulse frequent, sharp—rhus; veins full—podophyllum; tissues full, edematous—apocynum; muscular pain—macrotys; nervous, free from fever—pulsatilla; periodicity—quinine; dull, stupid, sleepy—belladonna; pain of serous membranes—bryonia; dusky coloration of surface of mucous membranes—baptisia; mucous membranes deep red—acids; mucous membranes pale—alkalies.

CHAPTER III.
REMEDIES AND THEIR USES.

Achillea Millefolium—Yarrow.

YARROW acts directly on the urinary apparatus, and the reproductive organs of the female. It constricts capillaries and relieves irritation. Through this action it overcomes passive hemorrhage. Its action on the urinary organs is marked in kidney, vesical and urethral irritations, such as suppression of urine, strangury and conditions presented in the early stages of some cases of Bright's disease. It is often employed with advantage in atonic amenorrhea, vaginal leucorrhea, diarrhea and dysentery. It is also deemed a remedy of merit in hematuria, hemoptysis, hematemesis, and in passive hemorrhages from the uterus, as well as in some cases of bleeding piles.

Achillea millefolium is alterative, diuretic and astringent.

Indications.—Vesical, renal and urethral irritation; leucorrhea; menorrhagia and atonic amenorrhea; piles with discharge of bloody mucus; suppression of the lochia; hematemesis and hemoptysis.

Dose.—Fluid extract, 5 to 60 drops; oil, 5 to 10 drops; specific medicine, 5 to 60 drops. Usual dose.—5 to 20 drops.

Acidum Aceticum Dilutum—Dilute Acetic Acid.

When administered before meals, acetic acid checks excessive acid secretions, and when taken in moderation with food it aids digestion by excitation of the salivary secretion and by its solvent action on foods. An excessive use of it impairs digestion and nutrition. Applied with a sponge to the skin it checks excessive sweating and acts as a cutaneous stimulant. It is a good remedy in hemorrhage from the uterus or intestines. For this purpose it should be largely diluted with water and used as an injection. Vinegar is a good remedy in carbolic acid poisoning. It counteracts both the external and internal action of carbolic acid. Dilute the vinegar and use freely.

Acetic acid in a concentrated form is corrosive and irritant. Indications.—Excessive acid
secretion; excessive sweating; uterine hemorrhage; carbolic acid poisoning.
Dose.-30 to 60 drops.
Usual dose.-10 to 30 drops, largely diluted with water.

Acidum Benzoicum-Benzoic Acid.
A solution which is convenient and medicinally effective may be made by adding two parts of benzoic acid and three parts of the borate of sodium to thirty parts of water.
Benzoic acid is stimulant, expectorant and disinfectant.
Indications.-Excessively alkaline urine, causing frequent urination or nocturnal enuresis;
excessive excretion of phosphates; cystitis, when the urine is ammoniacal; irritation of the urethra from excessively alkaline urine.
Dose.-3 to 30 grains. Usual dose.-3 to 10 grains.

Acidum Boricum-Boracic Acid.
In typhoid fever boracic acid is used internally, either in powder or solution. Adults should be given from ten to fifteen grains three or four times a day. In this condition its use lessens the tympanites, improves the character of the stools, increases the quantity of urine, and causes the tongue and skin to become moist. In the summer diarrhea of children it is also a good remedy. Its freedom from irritating effects makes it a most excellent local antiseptic. It may be used in saturated solution. An alcoholic solution is of value in urticaria and pruritus. A solution of two parts in one hundred parts of water may be injected into the bladder. As an antiseptic surgical dressing it is extensively used.

One part of the acid mixed with five parts of lard or vaseline constitutes a good ointment in eczema; and an ointment consisting of one part of boracic acid to four parts paraffin is useful in burns, otorrhea, nasal discharges, wounds and ulcers. This acid is also extensively used for impregnating surgical dressings. English lint being soaked in a boiling solution and then dried.
Boric acid is a non-irritant antiseptic.
Indications.-Internally: Typhoid conditions; summer diarrhea of children. Locally: Suppurating wounds; ulcers; burns and scalds; urticaria; pruritus and eczema.
Dose.-5 to 30 grains.
Usual dose.-5 to 15 grains, three or four times a day.

Acidum Camphoricum-Camphoric Acid.
Camphoric acid has a specific action upon the skin and mucous membranes. It is claimed that the most excessive night sweats of consumptives are controlled by this drug, when twenty grains of it are administered in a capsule one hour before going to bed.
Indications.-Excessive mucous discharges; profuse sweating during recovery from fevers; night sweats of consumptives.
Dose.-1 to 20 grains.
Usual dose.-5 to 10 grains.

Acidum Citricum-Citric Acid.
Citric acid is a true specific for scurvy, and when used freely by persons who are compelled to subsist largely upon salt meat diet it acts as a preventive of scurvy. It has also been employed with good results in some forms of rheumatism. It stimulates the secretions of the mucous and salivary glands, and, largely diluted with water, constitutes a cooling, refreshing and useful drink in fevers.
Indications.-Scurvy and general scurbitic conditions. Dose.-5 to 30 grains.
Usual dose.-10 to 15 grains.

Acidum Gallicum-Gallic Acid.
Gallic acid is a good remedy in all forms of passive hemorrhage. In menorrhagia, hemoptysis, hematemesis and hematuria it is used successfully. It is also a remedy of value in leucorrhea, catarrh of the bladder, chronic bronchial catarrh, sweating of phthisis, and in profuse expectoration.
In albuminuria its administration is promptly followed by a greatly lessened discharge of albumin, and is frequently of great service.
Gallic acid is a powerful astringent.
Indications.-Hemorrhage from mucous surfaces of pulmonary and urinary tracts; excessive
secretion from mucous surfaces.
  Dose.-3 to 20 grains.
  Usual dose.-3 to 10 grains.

Acidum Hydrochloricum Dilutum-Dilute Muriatic Acid.
  This agent is frequently indicated in typhoid fever and in the advanced stages of diseases which
have a tendency to develop typhoid conditions. It is also a good remedy when the secretion of gastric
juice is scanty, if administered after meals.
  When given before meals it arrests the secretion of gastric juice. It is, therefore, a useful agent
when such secretion is excessive, if given before eating. In wrongs of the stomach which are benefited
by muriatic acid there are eructations of greasy, yellow, brown or bitter substances; the breath is hot
and pungent; there may be nausea and a tendency to emesis.

It is a remedy, therefore, in dyspepsia with these symptoms, and in stomatitis and in pyrosis. In
scarlet fever of a severe type, in diphtheria, and especially in its later stages, in syphilis and scrofula, as
a stimulant to the digestive organs; in intestinal indigestion, in fermentative diarrhea, in catarrhal states
of the, stomach in children, in dysentery of a low grade, in erysipelas, pneumonia, and even in
rheumatism, where there is a tendency to death of the blood (sepsis), muriatic acid is an excellent
remedy. Hydrochloric acid should always be administered in a liberal quantity of water, and if used in
large doses should be taken through a glass tube, to prevent its injuring the teeth.
  The concentrated form of hydrochloric acid is a corrosive poison. Diluted hydrochloric acid is a
febrifuge and antiseptic.
  Indications.-Deep red tongue; tongue coated brown; slick, clean raw-beef tongue; dusky-red
mucous membranes; brown sordes on teeth, gums and tongue.
  Dose.-5 to 40 drops, well diluted; specific hydrochloric acid, 5 to 40 drops, well diluted with
water.
  Usual Prescription.-J; Hydrochloric acid, dilute, gtt. x to xxx; water, :3 iv. M. Sig. Dose two
teaspoonfuls every two hours.

Acidum Nitricum Dilutum-Dilute Nitric Acid.
  In broken-down constitutions, with emaciation, and in derangements of the nervous system,
nitric acid is frequently indicated. In jaundice and chronic diseases of the liver it is a useful remedy,
and in syphilitic poisoning it is used with good results.
  Officinal nitric acid may be applied with a glass rod or a pine stick to unhealthy ulcers. A pine
stick dipped in the acid and immediately wiped with a cloth, will convey a sufficient quantity of the
cautic to the suppurating point. Excessive action of the acid may be prevented by the use of alkaline
solutions, or by applying subnitrate of bismuth in powder. A 1 or 2 per cent. solution of the officinal
acid frequently applied to syphilitic warts will cause their removal.
  "There are certain conditions of disease in which nitric acid is a very valuable remedy, and if it
is possible to tell when it is indicated it will prove one of the most valuable of our specifics.
  "There is a certain condition of stomach, in which there is irritability with enfeebled function,
in which nitric acid is the remedy. And there is a lesion of digestion and blood making other than the
derangement of the stomach named, in which nitric acid is a direct remedy. There is also added to this.
  or separate from it in some cases, an impaired nutrition as well as a slow and imperfect retrograde
metamorphosis of tissue and failure of excretion, in which nitric acid will prove a direct remedy.
  "Prof. E. Freeman informs me that he has employed it for some time in a class of stubborn
cases, presenting some of these features, with most marked success.
His cases have embraced those of enfeebled digestion and blood making, and enfeebledand depraved
nutrition; taking some cases of scrofula, bad blood, and even phthisis.
  "There are four ways of determining the use of these remedies. The first employs them hap-
hazard, in groups, singly or combined, simply because they have been used in diseases covered by a
name. The second is a better form of empiricism, and employs them one after another, in their
supposed order of goodness, until some one hits the case in hand. The third generalizes the symptoms,
and determines the quality of the lesion, and for this prescribes with some directness. The fourth tries
to determine the principal lesion-basic lesion we have called it-by some positive signs or symptoms,
and prescribes for this. Sometimes the prescription is in reality for a pronounced symptom, though if
we would inquire far enough we might know there was a constant lesion underlying it.

"In each of these four ways we may prescribe nitric acid; in the last two we may prescribe it in a rational manner.

"I will not undertake to point out the evidences of the pathological lesions, in which nitric acid has been employed with advantage, as our readers can read this up in our text books; but I will hazard a guess as to the specific indication in certain instances:

"If the tongue, whether pale, rose-red, or deep-red, presents a violet haze, we have an indication for nitric acid.

We will notice the same violet haze wherever blood comes to the surface in the capillary circulation. I think we get the most decided results when the mucous membranes are moderately red. Do not mistake the deep, solid purple of the mucous membranes we see sometimes for this violet haze, for here the irritable stomach very frequently presents the red tip and edges of tongue, and sometimes elongated papillae.

"We do not use it for its acid properties, but probably the benefit is due to the supply of nitrogen in a peculiar form. Of course this is but a supposition.

"I have treated success fully several cases of inveterate chronic ague, of malarial headache, and many other diseases, and of course, in experimenting, have missed it in some cases. I have only the desire here to call attention to the remedy, and have it thoroughly tested, asking that the symptoms be observed, so as to give us definite knowledge of the cases in which it will prove curative." (Scudder.)

Nitric acid is a corrosive poison, and destroys life with the most terrible suffering. Dilute nitric acid is refrigerant, expectorant and anti-syphilitic.

Indications.- Violet color of the tongue; tongue dry and covered with a glazed fibrous coating; diarrhea of children when the discharges are green, curdled and mixed with mucus.

Dose.-20 to 40 drops, well diluted.

Usual Prescription.-A Dilute nitric acid, gtt. x to xx; water, K iv. M. Sig. Dose one teaspoonful every hour or two.

Acidum Phosphoricum Dilutum-Dilute Phosphoric Acid.

This acid constitutes a valuable remedial agent in nervous debility arising from overexertion of the mind or from long continued grief. In brain-fog of brain workers its action is decidedly corrective, and in wrongs resulting from sexual excesses, or any nervous strain on the body, it has been used with marked advantage. It is also useful in leucorrhoea occurring after too early or too long continued menses, and in watery, painless diarrhea it often constitutes a medicament of curative power. The cases most likely to derive benefit from phosphoric acid are characterized by indifference, apathy and torpidity of body and mind.

Dilute phosphoric acid is febrifuge, tonic and nervous stimulant.

Indications.-States of depression and indifference; tongue relaxed, sticky and clammy; debility from overexertion of the mind; sexual excess.

Dose.-5 to 60 drops.

Usual Dose.-5 to 20 drops.

Acidum Picricum-Picric Acid.

This agent has been extensively employed as a dressing for superficial burns, and some remarkable results from its use have been reported. In one case a vessel of boiling water had fallen on a man's shoulder and the scalding liquid had flowed across his back and chest to his left hip. When stripped, he looked as though he had on an officer's scarf, there being a dark red mark across his body. He was groaning and seemed to be in great pain. He was put to bed at once and lint soaked in a 3 per cent solution applied. In a few minutes he declared he felt no pain, and in three days he wanted to leave the hospital.

In another case the writer says: "A man, following the trade of an iron founder, came to me in great pain. Some of the hot fluid iron had splashed in his eye and lodged in the inside of the upper lid from which it was extracted in a solid form by one of his shopmates. His eye was very much inflamed and bloodshot, the eyelid very much swollen. I painted the eye and lid freely with saturated tincture one part, water two parts. He was in much pain when I made the application, but a few minutes after he declared the pain was gone and in a few days he was well. I gave him a weaker solution to apply himself and with it he cured several burns among his shopmates; also on one occasion, one of his children had her hand scalded and another was burned across the palm of the hand. One application in each case took the pain away and in a few days cured."
Picric acid is not a suitable agent in the treatment of extensive and deep burns, as in such cases there is danger of poisoning. It controls pain and promotes healing. In superficial burns sterilized gauze is soaked in a saturated solution of the acid and laid over the burned surface, a light dressing placed over this and the whole retained by a light bandage. At the end of three days the dressing should be wet with the acid solution and gently removed. A second dressing may then be applied in the same way as at first. When pus no longer forms this dressing may be replaced by a simpler one. In some cases the acid solution is simply brushed over the burned surface, and a light dressing placed over it for a few days.

Alcohol or a solution of boric acid will aid much in removing the stains from picric acid.

Indications.-Superficial burns.

Acidum Salicylicum-Salicylic Acid.

This agent prevents decomposition and fermentations of all kinds. It may be used internally in all conditions showing indications of the presence of some poisonous substance in a state of decomposition. Erysipelas, surgical fever, pyemia, scarlet fever, acute rheumatism, intermittent fever and pneumonia are among the diseases likely to present indications for this acid.

As an application, injection or wash it may well be combined with borax—one part of each to one hundred parts of water. This solution constitutes a clean and cheap antiseptic, well adapted to the treatment of abscesses and suppurating wounds. It is also of value in inflammatory conditions of the eye and its surroundings.

"I believe that salicylic acid from wintergreen is decidedly preferable to that from carbolic acid as an antirheumatic, and remedy for neuralgia, or an antipyretic. One thing is certain: it is less irritant to the stomach. There are cases in which the salicylic acid is best given in pills—two grains at a dose—when it is used as an acid. This gave the marked cures of the first years of its use. Then it acted best as a salicylate of sodium, or potassium, in solution. I prefer the salicylate of potassium, and make the dose contain about two grains of the acid.

I have two rules that guide me in prescribing it. If the breath is markedly fetid, give salicylic acid or a salicylate. If the tongue is purplish in color, large, and coated in the center, give salicylate of potassium." (Scudder.)

Salicylic acid is a deodorizer and an antiseptic. It should be used with caution. Very large doses have induced acute delirium and rapid collapse and even death.

Indications.—Acute and subacute rheumatism, with high temperature, bluish moist tongue and soft skin; foul and offensive breath in ulceration of the stomach and of the lungs. Locally: tonsillitis, fetid catarrh, indolent ulcers, pruritus, chilblains, and in all septic conditions.

Dose.—1 to 15 grains.

Usual Dose.—1 to 10 grains everyone to three hours, in pill or tablet form.

Acidum Sulphuricum Dilutum-Dilute Sulphuric Acid.

This acid is used with much advantage in diarrhea, especially when accompanied by great prostration. In inflammatory conditions, especially in inflammation of the vital organs, it is of great value, and in erysipelas it is used with satisfactory results.

In passive hemorrhage, where there is feebleness of mucous membranes, with inactive capillary circulation, it constitutes an excellent remedy, and in colliquative night sweats it exercises an influence which is decidedly corrective.

Dilute sulphuric acid is antiseptic, astringent and tonic.

Indications.—Tongue having a brown coating which is nearly black in the center, with dark mucous membranes; dry tongue, with red tip and edges; diarrhea with extreme prostration; passive hemorrhage, with feebleness of mucous membranes and sluggish capillary circulation; excessive mucous discharges.

Dose.—2 to 10 drops in water.

Usual Dose.—3 to 5 drops, well diluted with water.

Acidum Sulphuricum Aromaticum-Aromatic Sulphuric Acid.

Acidum Sulphurosum—Sulphurous Acid.

This agent possesses properties similar to those of dilute sulphuric acid. It should be administered by means of a glass tube, so as to protect the teeth from the action of the acid.

Aromatic sulphuric acid is tonic, stimulant and astringent.

Indications.—Dark red or brown tongue and mucous membranes; sordes on the teeth, with impaired condition of the blood; ulcerative stomatitis; diarrhea with extreme prostration; passive
hemorrhages; feebleness of the mucous membranes with sluggish capillary circulation; colliquative night sweats; nervous prostration.

Dose.-5 to 30 drops, largely diluted with water
Usual Dose.-5 to 10 drops in four ounces of sweetened water three times a day.

Acidum Sulphurosum-Sulphurous Acid.

This well known remedy is employed with excellent results in typhoid fever, and in pneumonia when there is a typhoid condition it exerts an influence which is unmistakably curative. It is also a most efficient remedial agent in many cases of scarlet fever, and in dysentery it is often used with great advantage.

"We employ it as an anti zymotic, and a parasiticide, and not for the common purposes of an acid, though here, as in the cases of the alkaline sulphites, there must be the general indications for an acid, as there was with them for an alkali.

"The sulphurous acid, like the alkaline sulphites, specifically antagonizes zymotic causes of disease.

It is well to keep in mind the fact that this is something more than simply arresting or modifying the septic process, for the zymotic influence frequently destroys the life of the fluids and solids without producing putrefaction.

"We prescribe sulphurous acid as an anti zymotic in those cases which present reddened mucous membranes, with brownish coatings of tongue and sordes. Given the indications for the use of an antizymotic, with toe indications for the use of an acid, we select the sulphurous acid.

"Sulphurous acid may be employed in yeasty vomiting-, in aphthous mouth and throat, or wherever the presence of microscopic fungi is suspected, with the same certainty as the sulphite of sodium. We also use it in porrigo, trichosis of scalp, pityriasis versicolor, with excellent results. As a local application it should be diluted with from two to six parts of water.

"I wish to call especial attention to its use in some diseases of the throat, by the spray or atomizing apparatus. In diphtheria, with dark redness of mucous membranes, and fullness with relaxation, there is no local remedy equal to sulphurous acid spray. It is equally beneficial in those cases of cynanche maligna, with dark redness of mucous membranes. Whilst in ordinary sore throat from cold, with dusky discoloration, it offers one of the best local applications in the materia medica." (Scudder.)

"This is the acid that forms in combination with other elements the ite salts-like the sulphite, hyposulphite and bisulphate of soda and the sulphites of potash and magnesia. These salts are closely relative in their action to sulphurous acid; and we wonder if their medicinal action is not due in whole or in part to the sulphur element. They are given in closely allied conditions in which there is pallor of the mucous membranes. The acid is given when there is redness) although sulphurous acid is not used for the general purposes of an acid. In this direction its action is feeble. Sulphurous acid is generally made by deoxidizing sulphuric acid by means of charcoal and passing the fumes into water. Of this sulphurous acid gas 9.2 is absorbed by the water. This gaseous element soon escapes, and the drug is worthless. Instead of sulphurous acid there remains a dilute sulphuric acid, which is altogether different in its action. Therefore, only the fresh, chemically pure article should be used. It has a not unpleasant, sour, sulphuric taste, and internally it may be given in fluid drachm doses of a dilution of one part of the acid to nine parts of water.

For local use it should be diluted in the proportion of one to twenty or more.

"Sulphurous acid is variously classified as a remedy. It has a place among the disinfectants, the deodorizers, the antizymotics, the antisepsics, etc. Eclectically it is specifically indicated in any disease in which there is a below-par state, with redness of the mucous membranes; the tongue is slick, glutinous-raw beef; later it may be brown, with a dirty colored coating-sordes; there is a mawkish, disagreeable odor to the excretions and to the breath; the tissues are full, feeble and relaxed. Its local use is demanded when the same conditions prevail generally or locally-as in wounds; there is fullness, feebleness, relaxation and a tendency to slough-the wound is dirty and sticky, unhealthy. Dirty is an excellent word to use in this description.

When sulphurous acid is the remedy there is a dirty, red, muddy color of the mucous membranes; when it is a sulphite of soda there is the same dirty appearance, but we have pallor of the tissues and a white coating upon the tongue, which in later stages becomes brown. Yeasty vomiting, which is frequently seen in many of these depressed conditions, is an indication for sulphurous acid.

"With these indications always vividly before us, there is no trouble in prescribing sulphurous acid in zymotic diseases like typhoid fever, etc. No other remedy will act so promptly. In scarlet fever and in diphtheria, with deep redness, full and relaxed tissues, and evidences of a death of the blood,
sulphurous acid locally with a spray, and internally, is the proper remedy.

It is both an antiseptic and a parasiticide—a germicide. The same may be said of it in cyananche maligna, aphthous ulcerations, and even in the sore throats due to cold."

Sulphurous acid is antiseptic and disinfectant. In a concentrated form it is highly destructive to life.

Indications.-Tongue of natural color, but full and dirty; tongue coated with a nasty substance, yellowish-brown in color; tissues of the throat full and lifeless in appearance; skin having a lifeless and rusty appearance. Locally: Enfeebled and sloughy mucous membrane.

Dose.-15 to 60 drops, well diluted; specific sulphurous acid, 5 to 90 drops, well diluted. Usual Prescription—A Sulphurous acid, 3 ii, water, K iv. M. Sig. Dose one teaspoonful every hour or two.

Acidum Tannicum-Tannin.

Tannic acid with many physicians is a favorite remedy in diarrhea, on account of the smallness of the dose in which it may be efficiently used, and from the fact that it seldom irritates the stomach and bowels. Used as a snuff, in bleeding from the nose, it will relieve many severe cases. As a gargle in elongated uvula, it promptly contracts the tissues involved. In local hemorrhages tannin dissolved in glycerine affords a most convenient and powerful astringent application. Pure glycerine will dissolve nearly its own weight of tannin, and, as the solution will readily mix with water, an application of almost any strength can be quickly prepared. The solution should be of recent preparation and kept in a dark place, as it decomposes. Tannin is a powerful astringent.

Indications.—Exhaustive discharges; hemorrhage from the nasal cavities; elongated uvula.

Dose.—1 to 10 grains; glyceritum, 10 to 40 drops.

Usual Dose.—2 to 5 grains.

Acidum Tartaricum-Tartaric Acid.

Tartaric acid stimulates the mucous and salivary secretions, and is often used for this purpose in fevers. It has also been employed as an application to the throat in diphtheria, the effect being to convert the membrane into a gelatinous mass, which is more easily expelled.

Tartaric acid is sedative, antiseptic and refrigerant. In large doses it is an irritant poison, and has caused death. Its antidotes are magnesia and carbonate or bicarbonate of soda.

Indications.—Deep redness of mucous membranes, with dryness of mouth; all fevers when an acid drink is indicated.

Dose.—5 to 30 grains.

Usual Dose.—5 to 10 grains. largely diluted with water.

Aconitum Napellus-Aconite.

Aconite is one of the most useful remedies in our materia medica. The drug has been so long and so extensively employed that the physicians are numerous who believe that they know all there is to know about its curative action; but aconite is a remedy possessing great and varied possibilities—much greater than anyone man can readily ascertain.

In all forms of disease, when the pulse is small and frequent, aconite lessens vascular excitement and the rapidity of the circulation, promotes secretion from the skin, and reduces the temperature. It moderates the force and frequency of the heart's action—increasing the power of the heart and the tone of the blood vessels.

It also has a decided action on the excretory organs, and its control over the excessive action of the skin, bowels and kidneys makes it a remedy of great value in the summer complaints of children. Aconite is, without doubt, our most frequently indicated remedy.

Cholera infantum, diarrhea, dysentery, tonsillitis, croup, simple and continued fevers, scarlet fever, diphtheria, measles, parotitis and rheumatism are among the most common diseases likely to call for aconite as a part of the treatment.

In tonsillitis aconite is a very useful internal medicament, and much good may also be derived from its local influence. This influence may be conveniently secured in the following manner: Add two drachms of the specific medicine to two ounces of vinegar and two quarts of water. Then have the patient inhale the steam produced by placing one or two hot stones in the vessel containing the combination. This steaming process should be continued about five minutes, and repeated every two or three hours.

Aconite constitutes an essential part of a valuable liniment which is made as follows:

Specific aconite ..................................... 3 iv. Chloroform ........................................
.......................................................... K i. Soap liniment, q. s. ad ............................ K iv.
M. Sig. Apply with the hand two or three times a day.

This liniment constitutes a most efficient application in all forms of rheumatism and in neuralgia, and its use in strains and sprains will yield equally good results.

"Aconite is a stimulant to the sympathetic system of nerves and increases the power of the heart to move life blood, at the same time that it places the blood-vessels in better condition for its passage. It will be recollected that the same system of nerves governs the movements of the heart and of the entire system of blood-vessels. What influences one will, therefore, influence the other in the same manner.

"But aconite is said to be a sedative; and by a sedative we are to understand a remedy that diminishes the frequency of the pulse. How can aconite, therefore, be a stimulant and a sedative? "There is no doubt but that aconite is one of the most certain remedies we have to reduce the frequency of the pulse in certain conditions of disease. And the condition is that in which there is a want of power on the part of the heart, and a like want of innervation to the capillary system of blood-vessels. Aconite in small doses lessens the frequency of the pulse, because it removes obstruction to the flow of blood in the vessels, and gives greater cardiac power.

"We employ it in all forms of fever, to control the circulation and diminish the temperature. Used in the doses herein named, it gives greater freedom to the circulation, at the same time that it diminishes the frequency of the pulse. It seems to remove obstruction to the free circulation of the blood, at the same time that it removes irritation of the cardiac nerves, and gives increased power to the heart.

"Its action in inflammation is as pronounced as in fever. It directly antagonizes inflammatory action, and in the early stage will arrest it speedily-if this is the sedative indicated.

"There are some diseases of an inflammatory character to which aconite is specific, that deserve mention. The first of these is tonsillitis, in which we employ it by internal administration, or better by the use of the steam atomizing apparatus. In some forms of mucous croup, with enfeebled circulation, in muco-enteritis, and in simple colitis or dysentery from cold, I never think of making any other prescription.

"As the notice of the action of aconite in croup may not impress the reader sufficiently, I desire to say that I regard it as the most certain internal remedy in all forms of this disease, and if one cannot find a specific indication for another remedy, let him give this. I prefer gtt. ij to water K iv, a teaspoonful every fifteen to thirty minutes. Stillilngia liniment is the external application.

"To determine which of a class of remedies is applicable in a given case, is the most difficult task of the physician, and any information in this respect is of much value. I doubt whether anyone using aconite and veratrum would be willing to risk giving this estimate. Many may have an empirical intuition in regard to it, but most could venture nothing but a guess.

"Veratrum is the remedy where there is a frequent but free circulation. It is also the remedy where there is an active capillary circulation, both in fever and inflammation. A full and bounding pulse, a full and hard pulse, and a corded or wiry pulse, if associated with inflammation of serous tissues, call for this remedy.

"Aconite is the remedy when there is difficulty in the capillary circulation, a dilatation and want of tonicity of these vessels, both in fever and inflammation.

"In general terms, veratrum is the remedy in sthenia, aconite in asthenia; but there are too many exceptions to this to make it a safe rule for our guidance.

"Aconite is a remedy for the frequent small pulse, the hard and wiry pulse (except in the cases above named), the frequent, open and easily compressed pulse, the rebounding pulse, the irregular pulse, and, indeed, wherever there is the evidence of marked enfeeblement of the circulation.

"It is the sedative I associate with belladonna in congestion, especially of the nerve centers, and to relieve coma. Whilst I would use veratrum with gelsemium in determination of blood to the brain, and in active delirium.

"Veratrum acts more efficiently upon the excretory organs; indeed I believe it to be one of the most certain remedies we have to increase excretion. Hence it is employed with great advantage for those purposes usually called alterative.

"Aconite controls excessive activity of the excretory organs, whether of the bowels, kidneys, or skin. Thus it is our most certain remedy in the summer complaint of children, associated with belladonna in diabetes insipidus, with the bitter tonics and strychnia in phosphaturia and oxaluria, and with the mineral acids in night sweats." (Scudder.)

"Aconite increases the power of the heart to move the blood; at the same time it places the blood-vessels in a better condition for its passage, and yet we place this remedy among special sedatives. Will it sedate? Give this remedy where you have a rapid, small pulse and see how soon it
will bring down the number of pulse beats, and at the same time increase the strength of the individual beat.

"Aconite is the remedy for asthenia. The pulse is small, frequent, often easily compressed; there is difficulty in the capillary circulation; there is lack of tonicity in both heart and blood-vessels; there is increased temperature, and in the early stages there is coldness and chilliness. In acute cases this chilliness alone is indication sufficient for the use of the Aconite.

"We can trace the action of aconite when we give it, not mechanically, but intelligently. Give it for relief of acute chills and coldness in the early stages of disease. The arterioles under the influence of the vascular nerves, have contracted, cutting off peripheral blood supply. Hence the coldness. Aconite acting through the sympathetic nerves flushes these cutaneous arterioles the patient becomes warm, the chills are gone, perspiration becomes free.

"It is doubtless a fact that giving the single remedy we can get a better knowledge of the individual characteristic action of the remedy. On the other hand, with our present limited knowledge of many remedies, we can at times certainly make useful combinations. For instance, in pneumonia, according to indications, aconite may be combined with ipecac, bryonia or lobelia; in rheumatism with rhus, bryonia or macrotylus, or, when there is much pain and not sufficient bowel action, with colchicum.

"In cardiac trouble, where there is not only the characteristic weakness, but irritation shown by the varying and uncertain pulse, aconite can be combined with cactus." (Fearn.)

"This drug has a special or specific action upon the inflammatory disturbances of mucous and serous membranes. It has no superior in the early stages of diseases of the throat and larynx. This is especially true in affections of childhood. In tonsillitis or quinsy, in croup (with phytolacca), in pharyngitis, as well as in the early stages of bronchitis and pneumonia, aconite is an excellent remedy. It is also a very efficient remedy in diarrhea, dysentery, and in cholera infantum, as well as in pericarditis, pleurisy, peritonitis, meningitis, phrenitis, and in congestion of the brain.

"In the early stages of paralysis, when there is still an active hyperemia, aconite is frequently efficient. In the simple ephemeral fevers of childhood, and also in the various eruptive fevers, no remedy excels aconite in certainty. Perhaps belladonna is more often the remedy in scarlet fever, while aconite is the measles remedy. They can be well given together or in alternation, as any other remedy indicated, like rhus and gelsemium, can be used at the same time. Aconite is many times the best remedy in erysipelas. and in the nervous states that cause 'a rush of blood to the head.'

"When given in overdoses, aconite is a deadly poison, and there is no known antidote to its action. The symptoms produced by too large a dose are, heat in the stomach, frequent respiration, tingling of the lips and tongue, constriction or paralysis, stiffness of the fauces, cold hands, dizziness, perverted sight, slow pulse; finally speechlessness, deafness, convulsions, death. The first thing to be done in a case of aconite poisoning is to empty the stomach at once, before too much of the drug is absorbed. This may be done with the stomach-pump or a speedy emetic, like sulphate of zinc; or better, a hypodermic injection of apomorphine. After thorough emesis has occurred, charcoal may be given. Sulphate of atropine, or specific belladonna, or digitalis, should be given in large doses. Stimulants, like whisky, brandy and ammonia, should be pushed to the utmost. Coffee is an excellent remedy in aconite poisoning, and it is nearly always close at hand. A battery can also be used for its stimulating effect. As we have said above, there is no known antidote to an overdose of aconite, but these remedies, intelligently and perseveringly applied, will do much to overcome its untoward action, and perhaps, to a sufficient degree, to save the life of some person who has not taken enough of the drug to kill instantly." (Bloyer.)

Aconite is sedative, diaphoretic, diuretic, antispasmodic and narcotic. In large doses it is a very dangerous drug.

Indications.-Small and frequent pulse with increased temperature; hard, dry, painful cough; expectoration streaked with blood.

Doses.-Fluid extract of the root, 1-20 to 0 drop; specific medicine, 1-20 to 0 drop. Large doses (0 drop) of specific aconite will produce, in some persons, toxic symptoms.

Usual Prescription.-A Aconite, gtt. iii to x; water, K iv. M. Sig. Dose one teaspoonful every hour.

Actaea Alba-White Cohosh.

White cohosh exercises a beneficial influence on the functions of waste and nutrition. It also exerts a special action on the female reproductive organs, and is, therefore, of frequent usefulness in the treatment of some of the wrongs peculiar to women. As a remedy for after-pains it has but few equals, and in congestion of the uterus it is employed with marked success.

"White cohosh is very closely allied, as a remedy, to both the black and the blue cohosh; but for
some reason it has never gained the popularity of these remedies, and especially of the first. We
congess that our little experience with actaea, gained from the use of the infusion, was quite
satisfactory; but why we did not use it more extensively we cannot say, unless because of our
familiarity with so great a number of remedies of like action.

"It is certainly an active agent. Large and frequent doses of white cohosh will produce emesis
and violent purgative effects. Even grave gastro-intestinal disorders of the nature of an irritation or
inflammation, have been produced by overdoses.

"The properties ascribed to white cohosh as a remedy are alterative, narcotic, parturient,
emmenagogue, and a nervous stimulant. It is said to have a special or specific action upon waste and
nutrition, and upon the reproductive organs of the female.

"Through its decisive action on the female reproductive organs, it becomes an excellent remedy
in ovarian troubles with unpleasant sensations and extreme sensibility to the sense of touch over this
region.

In uterine congestion and neuralgia of the below-par variety, actea is a remedy the equal of
Macrotyis or caulophyllum, and the superior of pulsatilla. In menstrual wrongs and irregularities, like
amenorrhea, dysmenorrhea, and menorrhagia, it is a reliable remedy. In chorea, hysteria, in epilepsy,
and in convulsions of catamenial origin, white cohosh is of great benefit. The same is true of it in
debilitating leucorrhoeal discharges, and in prolapse of the uterus. It has been specially and highly
recommended as a remedy for troublesome after-pains, and as a partus preparator."

Actaea alba is emmenagogue, alterative, nerve stimulant, emetic and purgative.

Indications.-Atonic conditions of the gastro-intestinal tract; chorea, hysteria, epilepsy and other
convulsive conditions when connected with an abnormal state of the female organs of repro-
duction; uterine diseases characterized by atony.

Dose.-Fluid extract, 1 to 20 drops; specific medicine, 1 to 20 drops.

Usual Prescription.- A Actaea alba, gtt. x to xx, water K iv. M. Sig. Dose one teaspoonful
every two or three hours.

Adonis Vernalis-Spring Adonis.

This agent constitutes a valuable medicament in wrongs of the heart, both functional and
organic. Under its influence the heart's action becomes slower, more regular and more forcible. It also
greatly increases the urinary secretion.

"Its influence is somewhat like digitalis, but lacks the unpleasant features of that remedy. Its
tonic influence upon the heart is most marked. In one case the heart-beat ranged from 50 to 60 beats
per minute, when it should have been 70 to 90; very feeble and frequently irregular; at times dizziness,
partial loss of consciousness, and twice within a week syncope. A single day's use showed marked
improvement, and within a week the pulse had come up to 70 per minute, and regular. In this case the
trouble was evidently due to over-exertion-heartstrain. I have only used the remedy in a few cases, but
I have used it singly, and have watched its action carefully. From what I have seen I have hopes that it
will surpass digitalis as a cardiac tonic. I use it in small doses. Ten drops of the tincture are added to
four ounces of water, and a teaspoonful is given every three or four hours." (Scudder.)

Adonis vernalis is tonic, cardiac stimulant and diuretic. In very large doses it is an irritant, and
has caused paralysis of the nervous apparatus of the heart. It should be used with caution.

Indications.-Palpitation of the heart; mitral insufficiency; dropsy resulting from inefficient
action of kidneys; irregular action of the heart; difficult breathing caused by feebleness of the heart.

Dose.-Fluid extract, 1 to 2 drops; specific medicine, 1-10 of a drop to 2 drops.

Usual Prescription.- A Adonis, gtt. x to xx, water K iv. M. Sig. Dose one teaspoonful
every two hours.

AEgle Marmelos-Bael Fruit.

This agent promptly relieves diarrhea without causing constipation. The ripe fruit has an
agreeable taste, and is sometimes used to overcome constipation. A tincture of the root, bark and
leaves has been employed with good success in hypochondria, palpitation of the heart and asthma.

AEgle marmelos is a mild astringent.

Indications.-Diarrhea and dysentery.

Dose.-Fluid extract, 30 drops to 2 drachms.

Usual Dose.-30
to 60 drops.

AEsculus Glabra-Buckeye.

In that form of asthma which is not markedly paroxysmal Aesculus is prompt in exerting a
controlling influence over the difficult breathing. It is also beneficial in the difficult breathing of
As a stimulant to the nervous system in paralysis, and as a remedy in mental depression, Aesculus is used with success. In hemorrhoids it is also a medicine of curative power.

"The buckeye has been used in the treatment of hemorrhoids with much success. and I am satisfied that in some forms of the disease it is the most certain remedy we possess. I have also given it in a few cases of diseased uterus with good results- cases in which the entire organ was enlarged, the cervix tumid, with too frequent recurrence of the menstrual flow.

"The marked influence of the aesculus on the nervous system would suggest a line of experiment likely to lead to the development of valuable properties. It has already been employed as a stimulant to the nervous system in some cases of paralysis.

"We may reason in this way: A remedy that cures hemorrhoids must exert a powerful influence upon the circulation; whilst its poisonous action, often witnessed-vertigo, diminished sight, wry neck, fixed eyes, paralysis, convulsions, etc. show its influence upon the nervous system." (Scudder.)

Aesculus glabra is tonic, stimulant, astringent, febrifuge and antiseptic. In very large doses it is narcotic.

Indications.-Sensation of constriction in the chest; sensation of tightness in the region of the heart; difficult breathing of asthma; feeling of constriction about the rectum.

Dose.-Fluid extract, 1 to 5 drops; specific medicine, 1-5 to 5 drops.

Usual Prescription.- A .Aesculus glabra, gtt. x to 3 ii, water, K iv. M. Sig. Dose one teaspoonful every hour or two.

AEsculus Hippocastanum-Horse Chestnut.

Horse chestnut exerts a direct influence upon the pelvic contents, and is an efficient remedy in congestion of these organs, as well as in all reflex symptoms due to such affections.

"The influence upon the nervous system is similar in kind to the buckeye, though not so active. This will probably be its best field of action, standing midway between belladonna on the one hand and nux vomica on the other.

"It exerts the same influence upon the circulation as the aesculus glabra, and has been successfully employed in the treatment of hemorrhoids. It will doubtless be found to improve the circulation generally, and may be employed whenever there is want of power in the heart, capillary stasis, or tendency to congestion." (Scudder.)

AEsculus hippoc. has been variously classified. It is described as a tonic, an astringent, a febrifuge, a narcotic, an anti-spasmodic, etc. Eclectically, or specifically, if you prefer the term, it may be said to be a remedy in any disease in which general malaise, soreness, and fullness of the blood-vessels are the prominent symptoms-symptoms due to capillary stasis or congestion. All agree that it acts specifically upon the portal circulation, and relieves to a certainty conditions depending upon hepatic engorgement. It is a remedy for uneasiness or fullness and aching in the region of the liver, and especially so if there be a throbbing sensation.

AEsculus hippoc. is unanimously a remedy for hemorrhoids and rectal irritation of a congestive type. There is a sense of uneasiness, more or less aching or burning pain; of heat, itching, constriction, as if a foreign body were present. The hemorrhoids, in an Aesculus case, are usually large and purple; they rarely bleed; there may be present a diarrhea, with frequent and free evacuations; or with the sense of fullness there may be dryness, or even a spasmodic stricture of the rectum, causing a veritable proctitis, or a rectal neuralgia. The reflex disturbances due to these rectal troubles, such as headache, backache, dyspepsia of various sorts, and peculiar asthmatic disturbances, are all overcome by the persistent use of Aesculus hippocastanum.

AEsculus hippoc. is also an efficient remedy in many of the neuralgias of the internal viscera, and in many of the disturbances of the nervous system.

This is especially so when the condition of plethora and fullness referred to above is present. It is a remedy (and is said to have a specific action upon the uterine cervix, as well as upon the liver and rectum) in cervicitis and endocervicitis." (Bloyer.)

AEsculus hippocastanum is tonic, astringent. febrifuge, narcotic and antiseptic.

Indications.-Congestion of the colon, rectum and the entire pelvic viscera; large and purple hemorrhoids which seldom bleed; neuralgias of internal viscera; uneasiness and fullness, with aching in the region of the liver.

Dose.-Fluid extract 5 to 15 drops; specific medicine, 1 to 15 drops.

Usual Prescription.- AEsculus hippocastanum, gtt. x to xxx, water, K iv. M. Sig. Dose one
teaspoonful every two to three hours.

**AEtheris-Ether.**

In syncope ether is a valuable diffusive stimulant. It is also a good remedy in gastralgia. In surgical operations it is used by inhalation as an anesthetic, and as a spray to produce local anesthesia. As an enema it is employed in asphyxia and colic. By dropping or spray it is useful to relieve the pain of articular rheumatism and headache, and also as an aid in the reduction of incarcerated hernia. By spray against the part it produces local anesthesia. Subcutaneously it is of value in sudden collapse from any cause.

Hoffman's anodyne is a mixture of strong ether, alcohol and ethereal oil. The dose of this mixture is from 10 to 30 drops. Ether is narcotic, stimulant, antispasmodic, refrigerant, carminative and anesthetic. It is highly inflamable, and its vapor forms an explosive mixture with air. Its vapor is heavier than air. Therefore, in using ether at night the light should be kept above the patient. Ether should always be used with great caution It has frequently caused death.

**Indications.**—Syncope; hysterical paroxysms; gastralgia; cases requiring an anesthetic.

**Dose.**—5 to 40 drops.

**Usual Dose.**—5 to 20 drops.

**Agaricus Albus-Boletus.**

In the night sweats of consumptives agaricus is a superior remedy. It is also of value in periodic fevers, especially when the chills are brief and the fever almost continuous, and followed by little or no sweating. It also hastens the drying up of milk in weaning.

"The tincture of boletus exerts a marked influence upon the spinal and sympathetic nervous systems in certain cases of disease. It has been successfully employed in the treatment of epilepsy and chorea, and to check the rapid pulse with hectic fever and night sweats in phthisis. It has also been recommended in insanity where there is a feeble cerebral circulation and imperfect nutrition; and also in neuralgia with similar symptoms." (Scudder.)

Agaricus albus is anidrotic, antiperiodic, stimulant to the nervous system, and, in large doses, cathartic and emetic.

**Indications.**—Night sweats of consumptives; diarrhea of consumptives; profuse secretion; yellowness of the skin: aching of the back and joints; chills alternated with flashes of heat; chills confined to the back.

**Dose.**—Fluid extract, 1 to 20 drops; specific boletus, 1/4 to 2 drops.

**Usual Prescription.**—A Boletus, gtt. x to xx; water, 5 iv. M. Sig. Dose teaspoonful every two hours.

**Agimus Castus-Chaste Tree.**

In impotency and other abnormal conditions of the sexual system this remedy has been employed with the most satisfactory results.

Agimus castus is tonic and restorative.

**Indications.**—Deficient secretion of milk; excessive sexual desire; atonic condition of the reproductive organs of both male and female; loss of sexual power and coldness of genital organs.

**Dose.**—Tincture, 2 to 10 drops.

**Usual Prescription.**—A Agimus castus, gtt. x to xx; water, 5 iv. M. Sig. Dose teaspoonful every two to three hours.

**Agrimonia Eupatoria-Agrimony.**

Agrimonia is a remedy of great usefulness in all atonic conditions of the urinary apparatus. In chronic catarrhal diseases of the kidneys and bladder it has been extensively employed, and often with markedly curative results. It gives tone and strength to these organs, and may well replace many of the more prominent diuretics in many cases.

Agrimonia exerts a specific influence upon mucous membranes, checking profuse secretion and favoring normal activity. This action has suggested its' usefulness in chronic bronchitis and in phthisis. Its stimulant influence upon all the vegetative processes causes an improvement in the appetite, and favors digestion and nutrition.

"Given a pain in the region of the kidneys, and I always think of agrimonia as the remedy. In my practice I have seen wonderful results from it, in cases of months' and years' duration, and when everything had failed. I have found other uses for it, but this has been so prominent that I always associate the medicine and the position of the pain.
"Among neuralgias, nephralgia is one of the severest. It is a torture that might be borne for an hour or a day; but continued night and day for a fortnight or a month, the sufferer may well pray for relief or death. It varies in cause, in some a well defined lithemia, in others there is absolutely nothing to be determined wrong with the urine. I have seen cases where the urinary deposit felt like pounded glass; cases with muco-pus in large amount; cases where the triple phosphate would make the lower third of the urine turbid as if with albumin; cases where not more than an ounce or two of turbid, dark-colored urine would be passed in the day; and still cases where the normal amount of clear urine of specific gravity 1020 would be passed.

"What wrong of the renal nerves takes place to produce this pain I have never been able to determine. Enough to know that in agrimonia I had a remedy. It allayed irritation of the stomach, stopped nausea and vomiting, started secretion from the liver, and did all that seemed to be necessary. I have said to myself, if it has such a favorable action on the stomach, it should be one of our best stomachics and tonics—" (Scudder.)

Agrimonia eupatoria is alterative, tonic, stimulant and astringent.

**Indications.**—Deep-seated pain in region of the kidneys; colicky pain pointing in the lumbar region; pain extending from kidneys down ureters; catarrhal conditions of the bladder; uterine pain, with uneasiness in the lumbar region, and muddy, foul-smelling urine.

**Dose.**—Fluid extract, 5 to 30 drops; specific medicine, 5 to 30 drops. **Usual Dose.**—5 to 10 drops.

### Ailanthus Glandulosa-Chinese Sumach.

This agent is employed with advantage in dysentery and leucorrhea. It is also deemed a remedy of merit in atonic conditions of the nervous system.

"As a remedy ailanthus is, to a great degree at least, similar to our well-known rhus toxicodendron. Specific indications calling for ailanthus are either an atonic condition of the nerves, or of the mucous membranes of the body, or great general weakness and prostration. Because of its special tonic effect on mucous membranes, it is an excellent remedy in some cases of leucorrhea, etc. For the same reason it has been highly praised as a remedy in many dyspeptic troubles. It has been highly commended as a remedy in malignant scarlet fever—in cases in which all evidences of sepsis are quite pronounced or prominent, such as dusky eruption, dirty, dry, cracked tongue, malignant sore throat and tonsils, with sordes on the teeth, and excoriating discharges from the nose and mouth, bad respiration, an adynamic persistence of disagreeable symptoms telling of blood poison. It should be classed in this instance as an antiseptic, and in the same class with baptisia, echinacea, etc.

"With special reference to the action of ailanthus as a tonic to the nervous system, it is efficient as a remedy in some cases of asthma, as well as in epilepsy and in many cases of epileptiform contraction of the muscles, etc. Frequently ailanthus will relieve nervous palpitations and severe cases of singultus, that have withstood for a long time all other remedies.

"In overdoses ailanthus causes vertigo, severe headache, pains in the back and limbs, together with great prostration, tingling and numbness; it reduces the pulse-beat and the respiration, and if it be given too frequently or in too large doses it causes death by paralyzing the respiratory center. It is said that both quassia and gentian intensify its action, and that it should not be administered with either iron or lead preparations." (Bloyer.)

**Ailanthus glandulosa** is nerve tonic, antispasmodic, astringent, anthelmintic and purgative. In very large doses its action is much like that of tobacco on persons not accustomed to its use.

**Indications.**—Atonic conditions of mucous membranes; epileptiform contraction of muscles; palpitation; atonic condition of the nervous system; great general prostration.

**Dose.**—Fluid extract, 1 to 15 drops; specific medicine, 1 to 15 drops. **Usual Prescription.**—A; Ailanthus, gtt. x to xxx; water, K iv.

**M. Sig.**—Dose one teaspoonful every hour or two.

### Aletris Farinosia-Unicorn Root.

This agent was deemed an important constituent of many of the compounds employed by the early Eclectics. In many instances, however, in using what they supposed to be aletris they were in reality employing helonias. Probably the use of the common names stargrass and unicorn root was
largely at fault for this state of affairs. Finally it was pointed out by Prof. Lloyd, the author of the pharmacological part of the supplement to the American Dispensatory, that the drug that had for years furnished the medicine aletris was in reality helonias. That the given uses of the two preparations, sold respectively under the name of aletris and helonias, were usually the same, or nearly the same, is well known to practitioners, and thus the two drugs have gone hand in hand as medicines of special value in uterine disorders. Consequently, when preparations of true aletris were employed for such purposes and no results were obtained from them, they were called uncertain remedies, and the reason is apparent. The gynecological uses of both drugs have been established from helonias and not aletris. Therefore, it turns out that after all these years aletris must be re-studied, and this will furnish a good opportunity for the young physician to make a differential study of the two drugs, and determine the indications for aletris.

"Nowadays the specific medicine is in common use, and may be given in doses as large as one fluid drachm. It is not a very active remedy, though the effect produced varies with the size of the dose given. Small doses are tonic, increase the appetite, loosen the bowels, and promote the secretion of urine.

"It is a remedy in those digestive or dyspeptic troubles which are attended by anemia. Prof. Goss says it is a remedy for 'gastric depravity.' Thus it becomes a remedy in worn-out women, chlorotic girls and nutrition less men. As a remedy in many cases of flatulency, of colic, of chronic constipation, etc., it should not be overlooked. It can be used alone, or in alternation or in combination with other stomach remedies.

"In nearly all of the writings within our reach, great stress is put upon aletris as a remedy having a specific action upon the reproductive organs of the female. It is said to be indicated by too frequent menstruation, with labor-like pains, and general pelvic weight, debility and discomfort. It has a special action upon the womb, increasing its strength and function. It is therefore a remedy for sterility due to inactivity of the uterus. It is also a remedy for that 'tired feeling' in the anemic woman who has leucorrhoea, is constipated, or has constipation with pain in the rectum. Its tonic action relieves, if it does not wholly overcome, morning sickness of pregnancy; hurries on tardy menstruation, and increases the flow when it is scant. In fact, it is a 'uterine regulator.' It is the remedy for the woman who aborts frequently, or in whom there is a disposition to abort because of her low vitality.

It is a remedy in this respect, a companion to, or very much like, mitchella repens and Viburnum prunifolium. It is a remedy for some cases of hysteria, for a prolapsed anemic uterus, for pelvic discomfort from any cause when coupled with anemia. It is the congener of pulsatilla, macrotys, caulophyllum, etc.

"Aletris, taken as a whole, is an active remedy, and richly deserves much greater attention than it receives from the physician of to-day."

Aletris farinosia is gastric stimulant, diuretic, expectorant and uterine tonic. Large doses act as an emeto-cathartic, and produce nausea, vomiting, dizziness and purging.

Indications.-Flatulency; colicky pains; atonic conditions of the digestive organs; too frequent menstruation, with labor-like pain and sense of debility in the pelvis.

Dose.-Fluid extract, 1 to 60 drops; specific medicine, 1 to 60 drops.

Usual Prescription.-Aletris, gtt. x to xx; water, K iv.

M. Sig. Dose one teaspoonful every three hours.

Alnus Rubra-Tag Elder.

This agent was a favorite remedy with the early Eclectics, and was employed by them with great advantage in the treatment of many chronic diseases. It improves nutrition and increases waste. It also stimulates and increases the secretion of gastric juice, and in this way becomes an efficient remedy in indigestion due to debility of the stomach. In the treatment of skin diseases, either of the eczematous or pustular variety, it has been employed with excellent results, and in glandular enlargements its action has proved corrective. The action of alnus upon the mucous membranes makes it an excellent remedy in nursing sore mouth, and in some cases of passive hemorrhage it has been employed with much benefit. Alnus is slow in its action, and should, therefore, be continued for a considerable length of time.

"Its special use seems to be in those cases in which there is superficial disease of the skin or mucous membranes, taking the form of eczema or pustular eruption. In these cases I have employed it as a general remedy and as a local application with the best results. It does not seem to make much difference whether it is a phlyctenular conjunctivitis, an ulcerated sore mouth or throat, chronic eczema or secondary syphilis presenting these characteristics, it is equally beneficial." (Scudder.)
Alnus rubra is alterative, resolvent, tonic and astringent. In large doses it is emetic. Indications.-Suppuration of the lymphatic glands; chronic skin diseases; conditions causing boils; breaking down of surfaces, resulting in ulcerations of the skin, mouth and throat; eczematous conditions.

Dose.-Fluid extract, 1 to 60 drops; specific medicine, 1 to 60 drops.
Usual Dose.-5 to 10 drops every two to four hours.

Aloe-Aloes.

Aloe is much used as a cathartic, but many better remedies can be employed.

"It is not as a cathartic that I would recommend aloes, but for a use that may seem very singular. In small doses it exerts a direct influence upon the waste and nutrition of the nervous system. In cases of feeble innervation, especially in persons of gross habit, it will be one of our best agents. I have usually prescribed it with tincture of nux vomica or with tincture of belladonna, the dose of a strong tincture being from two to ten drops.

"In some cases it will prove serviceable when associated with the bitter tonics, as in this: A Extract of nux vomica, grs. vi.; aloes, grs. xv; hydrastine, 3 ss. Make thirty pills. One may be given three or four times a day." (Scudder.)
Aloe is cathartic, emmenagogue, anthelmintic and stomachic.

Indications.-Hemorrhoids from partial congestion; profuse menstruation in females of relaxed fiber; watery diarrhea from weakness. To meet these indications the remedy must be used in the small doses named in the "Usual Prescription."

Dose.-Fluid extract, 10 to 30 drops; powdered extract, 1 to 5 grains.
Usual dose.- 1 to 2 grains.
Usual Prescription.-A Aloe socotrina, gtt. v to x; water, K iv. M. Sig. One teaspoonful every hour or two.

ALOIN.- This is the purgative principle of aloe vulgaris.
Dose.-1/4 of a grain to 5 grains.

Indications.-Constipation caused by atonic conditions of the large intestine.

A pill composed of one-fifth of a grain of aloin and one-sixtieth of a grain of strychnine constitutes a combination which will cure many cases. of constipation. One of these pills should be given from one to three times a day, as the case may require.

Alpinia Officinarum-Galangol-Colic Root.

This is an excellent remedy in forms of dyspepsia which are characterized by nausea and vomiting. It aids in the digestive process, preventing fermentation and promoting the removal of flatus.

Alpinia officinarum is a stimulating aromatic.

Indications.-Indigestion when there is fermentation and flatus; all cases in which an aromatic stimulant is needed; dyspepsia when there is vomiting or sickness at the stomach.

Dose.-Fluid extract, 5 to 20 drops.
Usual dose.-5 to 10 drops.

Alstonia Constricta-Australian Fever Tree.

This agent possesses tonic and antiperiodic properties similar to those of quinine, and is sometimes employed as a substitute for the latter drug. It has been employed in prostrating diarrhea with marked advantage, and in dysentery it has many times served a useful purpose. Its antiseptic properties have often been found useful in the diarrhea of typhoid fever, and also in the diarrhea of consumption. It is soothing to the irritated bowel and possesses a tonic astringency.

Alstonia constricta assists in the convalescence of low fevers, as well as in the convalescence of any acute disease, overcoming the debility of diphtheria, scarlatina, and that following parturition and lactation.

Alstonia constricta is tonic, antiseptic, astringent; febrifuge and antiperiodic.

Indications.-All diseases in which periodicity is a prominent symptom, such as intermittent and remittent fevers; diarrhea of typhoid fever; debility following acute diseases; irritation of the intestinal tract; debility dependent on lack of digestive power.

Dose.- Tincture, 10 to 60 drops; powdered bark, 2 to 8 grams. Usual Dose.-Tincture, 10 to 20 drops every hour or two, the first dose to be given several hours before expected chill.

Alstonia Scholaris-Dita Bark.

Dita bark possesses a considerable antiperiodic power, and has been successfully employed in
chronic intermittent fever.

The unpleasant taste which it leaves in the mouth makes it somewhat unpopular with many patients.

Alstonia scholaris is antiperiodic, febrifuge and tonic.

Indications.-All diseases in which periodicity is a marked symptom, such as malarial fevers, etc.

Dose.-Tincture, 20 to 60 drops; powdered bark, 2 to 10 grams.

Althaea Officinalis-Marshmallow.

Althaea has been employed with advantage in many affections of the kidneys and bladder. It increases the secretion of urine and exerts a demulcent influence upon all parts of the urinary mucous membrane. In acute cystitis its influence is relieving in character, and in strangury it has often proved useful. In gastritis, enteritis and bronchitis it is deemed a remedy of merit.

It is also of value in inflammation of the fauces and tonsils, and in coughs and hoarseness its soothing influence has been found useful.

"Marshmallow is an excellent remedy in diseases attended with pain, especially of the urinary organs. It relaxes the passages in nephritic complaints, in which cases a decoction is the best preparation." (Beach.)

Althaea officinalis is diuretic and demulcent.

Indications.-Renal irritation; acute dysentery and diarrhea; strangury; inflammation or irritation of the bladder; retention of urine; hematuria; gastro-intestinal irritation or inflammation.

Dose.-Fluid extract, 30 drops to 2 drachms; infusion, 1 to 2 ounces.

Alum-Alum.

Alum, in powder or solution, may be used whenever a mild and an irritating astringent is indicated. A solution of equal parts of alum and borax makes a curative injection in vaginal leucorrhea. A powder composed of two parts of alum and one part of orris root constitutes an efficient treatment in excessive sweating of the feet. A little of this powder dusted into the stockings daily will soon remove all offensive odor, and greatly lessen the perspiration.

Alum is a hemostatic astringent.

Indications.-Locally: Catarrhal conditions, especially when there is great relaxation of mucous membranes, with thin and watery discharges; passive hemorrhage; vaginal leucorrhea; excessive perspiration of the feet.

Ambrosia Artemislaefolia-Rag Weed.

Ambrosia has been used with advantage in fevers in which there was a tendency to putrescency, and in diarrhea and dysentery with this characteristic its employment has been followed with good results. It is also useful in hemorrhages which are not extensive. Rag weed is not very frequently employed by modern physicians, but the early Eclectics often obtained good results from its exhibition.

Ambrosia artemislcefolia is stimulant, astringent and antiseptic. Indications.-Fevers characterized by a disposition to putrescency; hemorrhoids; mucous fluxes; passive hemorrhages.

Dose.-Specific medicine, 1 to 20 drops.

Usual Dose.-5 to 10 drops every two or three hours.

Ammonii Acetatis, Liquor-Spiritus Mindereri-Solutioll of Acetate of Ammonium.

This solution is often employed in low forms of disease in place of alcoholic stimulants, as it acts well without causing cerebral disturbances. It is also used as a means of sobering intoxicated persons, one drachm being administered every fifteen minutes, after vomiting has taken place. It aids the eruptive process in measles and at the same time strengthens the patient. In the typhoid conditions which often appear in pneumonia it will assist in the process of expectoration, and do much toward carrying the patient above the stage of dangerous collapse.

"Liquor ammonii acetatis or solution of ammonium acetate, has long been a popular remedy, being most generally known as spirit of mindererus. When indicated it is a very valuable remedy, but to be of any value whatever, it must be properly prepared. The point we wish particularly to emphasize in speaking of this preparation, is that it should never occupy a place on the medicine shelf, but should only be prepared when needed for immediate use.
"This preparation may be easily prepared by the doctor. In fact, he should, if possible, do this himself. Several precautions are necessary to be observed in producing this medicine. If your ammonium carbonate is of poor quality, your spirit of mindererus will be equally valueless. Proceed as follows: Select a good piece of ammonium carbonate about the size of a walnut. Having poured into a suitable vessel any desired quantity of dilute acetic acid, drop the lump of carbonate of ammonium into it and let it remain in it until effervescence has ceased. Do not be deceived as to when effervescence ceases, for bubbles will continue to arise through the liquid for some time after the proper point has been reached. By watching the operation it will be observed that there comes a time when the active bubbling or foaming suddenly ceases, though a few gaseous bubbles still continue to rise. At this juncture remove the lump of ammonium salt and the solution will be found to be pleasantly acid and agreeable.

If the lump be allowed to remain longer than above indicated, the liquid will assume a disagreeably acrid taste, and you will have defeated your purpose so far as producing a good medicine is concerned.

"Spirit of mindererus is one of the two chief sobering remedies—the other being potassium bromide. In the Eastern States the latter is the favorite 'drunk mixture,' being used in the form of the elixir of bromide of potassium. Western physicians seem to have favored solution of ammonium acetate. It is not the remedy for confirmed cases and those commonly affected with delirium tremens, but is adapted to those individuals who have taken a little too much liquid refreshment to retain their sobriety. In these cases it is a very active sobering remedy for drunken-ness.

This solution is likewise very valuable in low forms of capillary bronchitis in children, and is peculiarly efficient in producing an eruption in the exanthemata, whether tardy or due to retrocession, and especially when associated with imperfect circulation. It should not be given in high inflammatory or febrile conditions. It may be employed in the low stage of typhoid fever, where alcoholics are not well borne. A good way to exhibit the remedy is in combination with simple syrup, directing the preparation to be kept upon ice, in cold water, or at least in a cold situation, until used up. It is a very efficient remedy for some forms of sick headache."

Ammonium acetate is diaphoretic, diuretic and stimulant.

Indications.-Eruptive diseases when the eruption is slow in making its appearance; lack of cutaneous secretion in non-inflammatory conditions; depressed nervous system when the skin is dry and the kidneys inactive; sick headache; painful menstruation and uterine colic; chronic rheumatism and gout.

Dose.-1 to 2 drachms.
Usual Dose.-1 drachm in one or two ounces of water.

Ammonii Benzoas-Benzoate of Ammonium.

The benzoate of ammonium renders the urine acid, arrests fermentation, and promotes the solution of renal and cystic deposits.

Indications.-Ammoniacal urine, which causes cystitis, incontinence of urine, or urine loaded with phosphates.

Dose.-5 to 30 grains. Usual Dose.-5 to 20 grains.

Ammonii Bromidum-Bromide of Ammonium.

The bromide of ammonium is a remedy of great value in the treatment of epilepsy. It has been used for many years in the treatment of this terrible condition, and with it many cases have been cured. It will not cure persons who have been afflicted with this disease for a long time, but it will cure a very large per cent. of the cases occurring in children. The dose given in the "Usual Prescription" is usually sufficient in the treatment of children from two to five years of age, but in some cases a much larger dose is required: In all cases the medicine should be continued for at least one year from the date of the last convulsion. The bromide of ammonium is also frequently indicated in cerebro-spinal meningitis, whooping-cough and severe occipital headaches.

The bromide of ammonium is tonic, sedative, or antispasmodic, according to the quantity used. In very large doses it produces poisonous effects, and in some cases mental derangements.

Indications.-Convulsions of children; involuntary movements of muscles, and a tendency to loss of consciousness.

Dose.-2 to 20 grains.
Usual Prescription.-I; Bromide of ammonium, 3 iss; water, K iv. M. Sig. Dose one teaspoonful four times a day.
Ammonii Carbonas—Carbonate of Ammonium.

The carbonate of ammonium is used in fainting, chloroform narcosis, after hemorrhages, and whenever a stimulant is needed in depressed action of the heart. It is also employed to counteract the depressing influence of anesthetics. In hysteria, with acidity, abdominal distension and eructations of gas, this agent is very useful.

The carbonate of ammonium in small doses is a diffusible stimulant and antispasmodic. In very large doses it is a powerful narcotic and irritant poison.

**Indications.**—Hysteria; nervous debility; flatulent colic; chloroform narcosis.

**Dose.**—2 to 10 grains.

**Usual Dose.**—This drug is best administered in the form of aromatic spirits of ammonia, using from 10 to 60 drops in water. This preparation consists of a solution of the carbonate of ammonium and ammonia water in alcohol and water, with aromatic essential oils.

Ammonii Chloridum—Chloride of Ammonium.

The chloride of ammonium—also known as the muriate of ammonia—is a stimulant to the capillary circulation. It is used with good success in non-febrile catarrhs, with tenacious expectoration. In chronic bronchitis it affords relief, and in chronic dysentery it is a remedy of merit. Nervous headache comes within its curative range, and in neuralgia it is a favorite remedy. Chronic rheumatism and rheumatic faceache are also benefited by its use. An aqueous solution of this salt constitutes a very efficient application in rhus poisoning, chilblains and indolent tumors. The solution may vary from the strength of five grains to an ounce of water to a saturated solution.

"The best indication for it is a dusky flush of the skin, the redness effaced by pressure returning slowly. A dusky redness of mucous membranes, not indicative of blood poisoning, will sometimes call for this remedy. It is also a good remedy when there is oppressed respiration, with bronchial sounds on auscultation, neither dry nor moist.

"We also employ a bath of muriate of ammonia as a stimulant to the skin, especially in the eruptive fevers when the eruption is tardy in appearing. In some cases it is used with an inunction, being rubbed up with lard." (Scudder.)

Chloride of ammonium is diaphoretic, diuretic, laxative, or refrigerant, according to the amount used. In very large doses it is a narcotic irritant.

**Indications.**—Tenacious expectorations; inflammatory effusions; tuberculous diseases; chronic pulmonary affections; nervous headaches; amenorrhea, resulting from deficient uterine action; neuralgic affections; hoarseness.

**Dose.**—5 to 30 grains.

**Usual Dose.**—1/2 grain to 10 grains.

Ammonii iodidum—Iodide of Ammonium.

The iodide of ammonium is used in asthenic chronic diseases, and for this purpose it is a useful remedy. In chronic headaches, when the circulation is feeble, and the patient has a stupid, heavy look, it is a remedy of value. It is also successfully used in chronic enlargements of the liver and spleen resulting from malarial influences. It is used locally as an application to boils, buboes and abscesses.

"Iodide of ammonium increases retrograde metamorphosis at the same time that it exerts a stimulant influence upon the nervous system, especially the sympathetic system. Thus it can be employed with less risk than iodide of potassium, when the nutritive powers are feeble, as is the case occasionally in secondary syphilis.

It has been employed in certain cases of persistent headache with excellent results. They are those in which the eye is dull, the face expressionless, the circulation feeble, the patient being of a full habit." (Scudder.)

The iodide of ammonium in small doses is alterative, diuretic and antisyphilitic.

**Indications.**—Headache, with dizziness; unsteadiness of walk; feeble circulation; enlargement of liver and spleen, of malarial origin.

**Dose.**—1 to 3 grains.

**Usual Dose.**—1/2 of a grain to 2 grains.

Ampelopsis Quinquefolia—American Ivy.
This agent has been employed in chronic diseases of the respiratory organs, such as chronic bronchitis and chronic laryngitis, with results which would seem to suggest further study. In chronic cutaneous affections it has also displayed important curative properties.

Ampelopsis quinquefolia is a stimulant to the mucous membranes and skin, alterative, diuretic, astringent, tonic and anti-syphilitic.

Indications.- Incipient phthisis; scrofula; chronic bronchitis; chronic laryngitis; chronic cutaneous affections; dropsy.

Dose.- Fluid extract, 30 to 60 drops.

Usual Dose.- Fluid extract, 10 drops in water every two or three hours.

Amygdalus Persica-Peach.

In acute gastritis this agent has been employed with gratifying results, and in cholera infantum it has many times acted curatively after failure to secure any beneficial action from other approved remedies. In one case reported the writer says that his little patient would almost immediately vomit up everything he gave it, and he had used every remedy usually employed in such cases, when amygdalus was suggested by counsel. It was administered, and promptly cured the patient. Amygdalus also exerts a corrective influence in vomiting of pregnancy, and in hemorrhage from the bladder it is deemed a remedy of usefulness.

"The infusion or tincture has a direct influence in quieting irritation of the stomach and upper intestinal canal. It is also a mild tonic, improving the functions of digestion. For these purposes it is one of the most valuable articles in the materia medica."

"It also exerts an influence upon the circulation and upon the nervous system which deserves investigation." (Scudder.)

"Of all remedies in the materia medica, there are few, if any, so valuable in the treatment of irritation of the stomach and its complications as this one. Its effect is both sedative and tonic to this organ, according to the dose given and the frequency of its repetition. When there is great irritation of the stomach, shown by an elongated, pointed tongue, with reddened tip and edges, and the patient is nervous, restless, and inclined to vomit even from a teaspoonful of water, or the smell or sight of anything to eat, with acute tenderness over the stomach, peach tree will act as a sedative, and should be given in frequently repeated doses. The intervals between doses may vary from ten to thirty minutes, while the case is extreme; when it becomes better the intervals can be lengthened. This method of administering the remedy is applicable to acute cases especially. When the same symptoms are present, but in a less marked degree, and in cases of long standing, its tonic effect maybe had from the usual dose given at intervals of three or four hours. It lessens irritation of the pneumogastric nerve, and will thus lessen fever.

"Peach tree is the remedy for vomiting when due to irritation, and the above symptoms present; for vomiting of nervous origin; and many times it is an excellent medicament in the vomiting of pregnancy, and will relieve when everything else fails.

"In gastritis, either acute or chronic, with other indicated remedies, amygdalus is always the treatment. With the symptoms here enumerated pronounced, it is the remedy never to be overlooked or forgotten in cholera in fantum, in cholera morbus, and in the debilitating diarrheas and dysenteries so common in children in the summer months.

"It has been highly extolled for certain kinds of cough due to an irritable condition of the throat and bronchial tubes; and in some cases of respiratory troubles of a like nature; also in some cases of irritable bladder, where there is extreme tenderness over this viscus.

"It is probable that the activity of the remedy is due more or less to the prussic acid contained in the preparations of the drug. It therefore can be given in overdoses, and ill effects may follow. Care should be exercised in giving it to debilitated and exhausted children.

As much as twenty drops of the specific medicine may be added to four ounces of water, and of this a teaspoonful may be given at intervals of from ten minutes to four hours, as the exigencies of the case may demand.

"Perhaps the best preparation of the drug is the cold infusion. The small twigs and bark of the minute limbs are placed in cold water. In a few hours the virtues have been imparted to the fluid, and this may be given in half or full teaspoon doses. Hot water destroys the value of the infusion. An alcoholic preparation excels the infusion prepared with heat."

Amygdalus per sica is tonic to the nervous and circulatory systems, sedative and anti-spasmodic. In large doses it is laxative.

Indications.- Tenderness in the epigastrium; irritability of the stomach; pointed and elongated tongue, with reddened tip and edges.

Dose.- Fluid extract, 1 to 10 drops; specific medicine, 0 to 10 drops.
Usual Prescription.- Amygdalus, gtt. xx; water, 3 iv. M. Sig. Dose one teaspoonful. In irritation of the stomach the dose should be repeated every fifteen minutes. When used to meet other indications the dose should be repeated every two or three hours.

Amyl Nitris-Nitrite of Amyl.

This agent is employed in various forms of disease of the nervous system, but if it is continued too long the pulse becomes very quick, small and thready, respiration very rapid, and the skin bluish in color. As soon as the patient becomes flushed, the pulse increased in frequency and the respiration more rapid, the inhalation should be discontinued, as the symptoms continue to increase for some time after the withdrawal of the remedy. Nitrite of amyl is antispasmodic and anesthetic. Indications.- Syncope and chloroform poisoning; epilepsy when the approaching attack is first felt; sea-sickness; nervous headache; toothache; earache; angina pectoris; dysmenorrhea; neuralgia.

Dose.-1 to 5 drops by inhalation from a handkerchief, until the pulse becomes more frequent. If necessary, the dose may be repeated as soon as the effects of the former dose pass off.

Anacyclus Pyrethrum-Spanish Chamomile.

Spanish chamomile is said to be a prompt and efficient remedy for toothache, and in relaxation of the uvula to exercise a corrective influence. It has also been highly recommended in palsy of the tongue and throat. Anacyclus pyrethrum is a powerful local irritant and stimulant. Indications.- Rheumatism and neuralgic affections of the face, palsy of the tongue and throat; relaxation of the uvula; toothache.

Dose.- Fluid extract (to be held in the mouth but not to be swallowed), 30 to 60 drops.

Anemopsis Californica-Yerba Mansa.

This agent has been somewhat extensively employed in the western and southwestern sections of the United States, and by many physicians it is deemed an efficient drug. It is certainly worthy of further study, and the indications which follows will suggest the lines along which such study is most likely to prove profitable.

One or two drachms of the tincture of this plant to four ounces of water makes a good nasal spray. A teaspoonful of the same mixture may be given internally every three or four hours. A strong infusion of the plant constitutes an efficacious application to saddle and collar galls on horses.

Anemopsis Californica is tonic, stimulant, astringent, carminative and antiemetic. Indications.- Bronchial cough; colds, catarrh and sore throats; bronchial and pulmonary diseases; diarrhea and dysentery; gonorrhea, with profuse discharge; malarial fever; syphilis. Locally: syphilitic sores; catarrh, sore throats and colds.

Dose.- Fluid extract, 5 to 60 drops.
Usual Dose.- 10 drops in syrup every three or four hours.

Anhalonium Lewinii-Muscale Buttons.

This agent is a superior cardiac tonic, but great caution must be exercised in its employment. Its long continued use, or its use in large doses, must be avoided. In highly wrought nervous individuals it has caused seminal emissions without erection.

Anhalonium lewinii is tonic, cardiac stimulant and sedative. Indications.- Angina pectoris; asthmatic dyspnea; oppression in the region of the precordia.

Dose.- Fluid extract, 1/4 to 1 drop. In severe cases 2 to 3 drops may be administered as a dose occasionally.

Anthemis Nobilis-English Chamomile. Matricaria Chamomilla-German Chamomile.

The therapeutic action of these important plants being similar it may be well to embody them both in one article. In the treatment of children indications for chamomile are frequently seen. In the colicky condition which frequently afflicts infants during the first few days of their existence, ten drops of this remedy added to five teaspoonfuls of warm sweetened water constitutes an efficient prescription, and the medicine, if given freely, soon removes the little one's sufferings.

Under all circumstances chamomile is said to be tonic, due to the bitterness; antispasmodic and stimulant, owing to a volatile oil; diaphoretic, emmenagogue, and emetic. We look upon the remedy as having a specific action upon the nervous system and upon the mucous membrane. The second named may depend upon the first. We are positive, however, that it is an excellent remedy in both the child and the adult, in troubles of an emotional nature, as well as in many diseases of a catarrhal nature, due to affected membranes.

"The child that should get chamomilla (or matricaria, as the specific medicine is called) is extremely restless and irritable; nothing satisfies it; it wants to be petted and carried, and cries when its wants, which are legion, are not satisfied. The nervous adults that should have matricaria are peevish,
'touchy,' extremely impatient, and sensitive to pain. They are hyper-esthetic; they are on the borderland of hysteria or hypochondria.

"Matricaria is an indicated remedy in many cases of incipient inflammation of the mucous membranes of the body. There are cough and evidences of cold, perhaps alternate flushing and pallor: shivering, with internal heat or fever, coryza, eyes hot and swollen; the stomach and bowels are disturbed; there may be pain, colicky diarrhea, or sour vomiting, etc.

"In our daily use of matricaria, more from habit than anything else, we prescribe it more frequently in diseases of children, than in diseases of adults. We believe it to be, however, as fully effective in one as in the other, when the indications for its administration are present. In debility of the digestive tract of children, and in many of the digestive wrongs incident to dentition, matricaria is a most valuable remedy.

The child is nervous, fretful, more or less hot, dissatisfied; it is restless, it twitches, and turns, and cries; there may be griping, colicky pains due to flatus; diarrhea is frequently present, and the stools are green and watery, or green and white, and slimy, often green and white and yellow mixed; the odor is usually foul, and there is frequently excoriation about the anus from the acidity of the discharge. There may be much or little fever, with or without a tendency to spasm. Any other indicated remedy may be given with or in alternation with matricaria.

"With these symptoms as a guide, we may prescribe matricaria with certainty and satisfaction in any of the nervous diseases of children; in dentition, in flatulent colic, and other digestive wrongs. It is a remedy for either constipation or diarrhea. It is a safe and efficient remedy frequently for the many rashes, and eruptions incident to babyhood. It is just as efficient for 'liver-grown' babies—those in which the liver is full, congested and tender. It is an excellent remedy for some urinary disturbances in children, as when there is an involuntary enuresis due to irritability of the bladder from cold, etc., or when there is difficult and pain in voiding the urine.

Matricaria has been highly recommended for the swollen breasts frequently seen in babies. We doubt whether it is as efficient as phyto-lacca in this disturbance.

"In adults matricaria will prove as efficient in the same class of diseases, with the same symptoms prevailing. It is especially recommended for amenorrhea from cold, and for dysmenorrhea, for neuralgia and for headache, and for false pains of pregnant women, as well as for many other nervous manifestations in these same patients. It is highly praised for its effects in certain cases of rheumatism, recent in nature, as well as for pains and vague manifestations of a hysterical nature or origin. The cold infusion has been praised for its effects upon malarial trouble.

"Matricaria has had its praises sung for its efficiency as a remedy when used both internally and locally in ill-conditioned ulcers, and in chronic skin troubles generally, when there is a tendency to ulceration; also in syphilitic ulcers, buboes, etc. It has had no little praise, and is frequently used by the Germans as a home remedy, both internally and locally in conjunctivitis and in inflammatory conditions elsewhere in which a poultice or wet compress can be used. The infusion, hot or cold, is a common, and we believe, beneficial remedy, when used locally, in some cases of chronic vaginitis and leucorrhea of a sub-acute character. It lessens both the pain and the discharge." (Bloyer.)

"Matricaria is usually listed as having properties similar to anthemis, but of less activity. It has, however, come to be preferred over the latter by Eclectic practitioners, and is now an important remedy with us, particularly in affections of young children. It has two particular specific fields of action—one upon the nervous system, subduing nervous irritability, and the other upon the gastro-intestinal tract, relieving irritation. Upon the nervous system its action is most pronounced, affecting both the sensory and motor nerves. It is peculiarly adapted to the nervous manifestations of dentition, and other affections where there seems to be a morbid susceptibility to pain. Earache, rheumatic and neuralgic pains, abdominal neuroses, etc., are relieved by it when the nervous apprehension is all out of proportion to the amount of pain experienced. A matricaria patient is restless, irritable, discontented, and impatient, and if a child, is only appeased when continually carried. In pregnancy it relieves nervous twitching, cough, false pains, etc., accompanied by great unrest. It should be borne in mind, however, that it is not the gross dose of matricaria that will overcome these morbid nervous phenomena, but the small, or almost minute dose. It is none of those agents, and we have many, that exert their peculiar effects only in small doses, yet can be used without harm in large doses, but without the peculiar benefit derived from the smaller amounts. It relieves the erythim producing hysteria—a little slowly, perhaps, but its effects are lasting—and for the conditions that threaten infantile convulsions during dentition, it is one of the most certain of drugs. After the spasms have supervened, it is not equal to gelsemium or lobelia.

"While it has been said that it has two specific fields of action—upon the mental and nervous, and upon the digestive tract—it must be remembered that the nervous manifestations calling for
matricaria are nearly always present in the disorders of the latter, while on the other hand, the nervous phenomena may occur without any disturbance of the latter. Hence the reference to the nervous symptoms of stomach and bowel disorders, given as specifically calling for the drug. In summer diarrhea of irritation (not of atony) it becomes an important remedy. The condition will probably not be without call for other specifics, but the indications for matricaria will be distinct. There is marked irritability, the child is peevish and fretful, the stools extremely fetid, and may excoriate around the anus more or less. In appearance they vary—may be watery and green, or slimy, per haps in yellow or white lumps, or it may be of undigested curds of milk, imbedded in a green mucus.

"In subacute inflammation and in congestion of the liver, small doses of matricaria are very efficient when the bowels are costive, the urine voided with difficulty, the child fretful and peevish, and the right hypocondrium tender. If fever is present, aconite may be associated with it. It corrects the skin eruptions and rashes due to these disorders. Alone, or associated with phytolacca, it relieves soreness and swellings of the breasts in infants, and is useful in suppression of the lacteal secretion. It is a remedy for flatulent colic with distension.

"Either small or large doses of matricaria (specific or infusion) are or value in amenorrhea, with sense of weight and heaviness in the womb, and bloating of the abdomen, accompanied with sudden nervous explosions of irascibility.

The infusion, given to the extent of producing free diaphoresis, relieves dysmenorrhea with labor-like pains, and tends to prevent the formation of clots. Various painful conditions, due to contracting colds, are relieved by matricaria in fusion associated with aconite. Among these may be mentioned earache, rheumatism, catarrhal affections of the bowels, ears, nose, and eyes. Locally, it has been used as a wash for leucorrhea, mammary abscess, ulcerating bubo, and catarrhal conjunctivitis."

(Felter.)

Chamomile is antispasmodic, tonic, stimulant, diaphoretic, emmenagogue and carminative. In very large doses it causes vomiting.

Indications.—Diarrhea of children when the discharges are slimy or green; abdominal pains and colic in children; irritability and nervousness of children caused by teething; nervous state causing children to cry and start in sleep.

Dose.—Fluid extract, 1 to 60 drops; specific medicine, 1 to 60 drops. Usual Prescription.—A

Anthemis, gtt. xx to 3 i; water, K iv; M. Sig. Dose one teaspoonful every hour.

Antimonii et Potassii Tartras-Tartar Emetic.

Tartar emetic, in very small doses, is a useful remedy in acute bronchitis, and in most congestive and spasmodic affections of the larynx and bronchi.

"The simplest indication for the minute dose of this remedy is increased secretion of the respiratory mucous membrane. To this may be added, a feeble pulse, pallid skin, cool extremities, cold sweats, uneasiness in the lower abdomen, and frequent desire to go to stool and urine. If we were giving it in the old fashioned dose, the indications would be the reverse of this. It is successfully used in croup, bronchitis with free secretion, in bronchorrhea, humoral asthma, and in pneumonia with abundant secretion." (Scudder.)

Tartar emetic is expectorant, diaphoretic, emetic and cathartic. In the small doses provided for in the "Usual Prescription" this remedy has no injurious effects. In large doses it acts as a violent poison.

Indications.—Difficult breathing, with wheezing; hollow and barking cough; hoarseness; stridulous breathing.

Dose.—1-16 of a grain to 2 grains (the latter is emetic).

Usual Prescription.—A Tartar emetic, gr. ss; water, K iv. M. Sig. Dose one teaspoonful every hour or two.

Apis Mellifica-Tincture of the Honey Bee.

Indications for apis are frequently found in diseases of the skin, and also in diseases of the bladder and urethra. Women are sometimes afflicted with sensations of heat and burning pains in the bladder and urethra, accompanied by an almost constant desire to urinate. In this unpleasant condition apis is a most efficient remedy; in fact, in any case where there is itching of the genitals, with heat and burning pains in the urethra, accompanied by a frequent desire to urinate, it is a most useful remedial agent. In amenorrhea, menorrhagia and leucorrhea, with acute congestion of the ovaries, apis is a potent remedy, and it also constitutes a useful medicament in vesicular erysipelas.

In urticaria, or "hives," when there is the usual itching or soreness, this drug can be employed with confidence that it will exert a decidedly curative influence.

In the treatment of diseases exhibiting a tendency to dropsy and in rheumatism when there is a
blanched puffiness and severe stinging pain, *apis* renders excellent service. It is also of decided value in edematous conditions of the throat.

In suppression or retention of urine (unless there is a stricture) *apis* has no superior in our materia medica. When continued for some time it increases the secretion of urine, and it is, therefore, a medicament to be considered in the dropsy attendant upon structural diseases of the heart. While it cannot be expected to cure such wrongs, it will afford a relief which will be highly appreciated.

"The tincture of the honey-bee is an excellent remedy if the diagnosis is well made. Given the peculiar burning pain that one associates with the sting of the bee, and I should think of this remedy.

Burning pain with itching in the urethra, in the bladder, or any part of the surface, is met by *apis.*" (Scudder.)

"The indications for *apis* are edema, with itching, burning, and smarting of the parts. While *apis* is now frequently prescribed by the writer, it was not so in former years. Having somehow become imbued with the idea that the remedy was worthless, suggestions from those who recommended it were received with a feeling of indulgent incredulity, and thus stubborn skepticism deprived me of a valuable weapon against disease. Within recent years *apis* has been given in edema, when accompanied with itching, burning and smarting, and has relieved the condition wherever situated.

"Edema is only a symptom, the causes being varied. It may result from cardiac, renal or hepatic affections, thrombosis, embolism, chlorosis or anemia. Judgment and reason must be exercised in the treatment of disease, and we should not expect to cure dropsy when caused by incurable lesions. Yet some cases have been cured by *apis* and iron, in which there was evidential heart complication, as shown by cardiac irregularity, palpitation, dyspnea, anemia, and great general distress, with tissues soft, pitting deeply upon pressure.

"*Apis* will relieve edema when there is smarting, burning and itching in the parts. It will relieve the smarting, burning and itching in chronic leg ulcers, if the parts are edematous. Conjunctivitis with burning, smarting and itching in the eyelids and surrounding tissues, if accompanied by edema, will be relieved by *apis*. *Apis* will relieve like conditions in erysipelas. It will relieve these symptoms in the urethra when accompanied by edema in any part of the body. It is not so effective in gonorrheal smarting, nor in cystic irritation, nor in irritation from acrid leucorrhoeal discharges, but it will sometimes afford relief.

"This remedy is recommended by many writers for various conditions, and has been used at intervals for almost a century.

I have never found it of any special value in any condition, unless there was edema with burning, smarting and itching. With these indications, no matter what the disease, it has been found effective." (Watkins.)

"We who practice specific medication are frequently surprised at the results of certain of our remedies when specifically used-surprised even though we give the remedy with the intention of securing the results which actually occur. It is a pleasant surprise-so much so that one feels happy to see such certainty follow his efforts to use medicines intelligently.

"Not long since, we treated a case of sore throat, having, as we believed, specific indications for a remedy. The patient, a woman of fifty-six, was taken with a chill, followed by an exceedingly sore throat and marked prostration. A physician was called, who gave medicine to stimulate her heart, which, as alleged, had been behaving badly. For the sore throat a warm solution of sodium bicarbonate had been directed to be used frequently as a gargle. The symptoms all became rapidly worse, and it now being the evening of the second day, we were called to see the case because the physician in charge was otherwise engaged and could not call that evening. Upon attempting to examine the throat, the patient had great difficulty in opening the mouth.

After depressing the tongue, the pillars of the fauces appeared like two pear-shaped sacs of water, and were very tender and painful. For the pain and soreness a wash of hamamelis in hot water was advised and for internal treatment teaspoonful doses of a solution of ten drops of specific *apis* in a half glass of water were given every half hour. Relief came quickly, and the edematous tissues were reduced completely in twenty-four hours. This brings to mind a similar case in an older woman, which was just as promptly relieved by *apis*." (Felter.)

"*Apis* is a very efficient remedy in retention of urine, and in some cases of irritation of the urethra; also for inflammation of subcutaneous structures, with tense and lancinating pains, and in irritation of the skin.

"I have seen a number of cases of disease in women, characterized by sensations of heat and burning pains in the bladder and course of the urethra, with frequent desire to micturate.
These have been promptly relieved by the use of specific apis, and in two cases of chronic disease of long standing a permanent cure was effected following the relief of these unpleasant symptoms. A peculiar burning pain, that one associates with the sting of the bee, is the indication.

"Apis is particularly useful in post-scarlatinal dropsy, when there is a blanched puffiness of the skin and the peculiar burning or stinging of the surface. We have no better remedy for simple uncomplicated urticaria, with intense itching and soreness, than specific apis in fractional doses. The direct indication for apis is constant desire, but inability to urinate freely, the urine being deep-red."

Apis mellifica is a very efficient diuretic. Indications—Itching, with burning of any part, hot, dry, burning and itching surfaces; suppression and retention of urine; dropsical conditions; constant desire to urinate, with inability to do so; irritation of the urethra, with burning, stinging pain; inflammations of the subcutaneous structures, with burning, stinging, tense or lancinating pains.

Dose.-Tincture, 3 drops; specific medicine, 1/10 to 2 drops.
Usual Prescription.-A Apis, gtt. v to xx; water, K iv. M. Sig. Dose one teaspoonful every hour or two.

Apocynum Andros RELATED-Intestinal dropsy.
In small doses bitter root is used as a stimulant to the digestive apparatus, and through its action on the digestive organs a corresponding impression is made on the general system. It has also been found useful in some forms of rheumatism and in diseases of the liver.

It is probable that the apocynum androssemifolium possesses properties identical with those of Indian hemp, and as the distinction is recognized with difficulty, even by those most conversant with botanic medicines, they have been used indiscriminately.

Apocynum androssemifolium is diaphoretic, tonic, laxative, and in large doses emetic.
Indications.-Chronic hepatic affections; intermittent fever and the low stage of typhoid fever; dropsical affections.
Dose.—Fluid extract, 5 to 20 drops.
Usual Dose.—10 to 15 drops.

Apocynum Cannabinum—Black Indian Hemp.
Apocynum is extensively employed in dropsy, and when administered in accordance with the specific indications herein given it is one of our most certain and valuable remedial agents.

By its use the absorbent system is stimulated and tone imparted to the blood-vessels, thus removing the edematous infiltration and preventing further exudation. It is of special value in dropsy of an atonic character. Apocynum is also frequently indicated in rheumatism, rheumatic neuralgia, diseases of the joints and diseases of the mucous membranes. In sciatica it is a remedy of curative power.

"The apocynum is a true specific for that atonic condition of the blood-vessels that permits exudation, causing dropsy. I have employed it in my practice for some eighteen years, and it has not failed me in a single case where the diagnosis was well made.

"It is a positive remedy for dropsy, whether it takes the form of edema, anasarca, or dropsy of the serous cavities, where there is no obstruction to the circulation and no febrile action. We would not expect to effect a cure in dropsy from heart disease, or ascites from structural disease of the liver, neither would we where there was a frequent, hard pulse and other evidences of febrile action. Still in these cases, if we can partially remove the obstruction in the first case, and after an arrest of febrile action in the second, the apocynum will remove the deposit.

"It is not worth while to inquire how it removes dropsical accumulations. It seems to strengthen the circulation, and as absorption takes place there is an increased flow of urine.

"I have also employed the apocynum in cases of passive menorrhagia with advantage. It may be especially recommended in those cases in which the flow is constantly too profuse, too long, and too frequently repeated.

"It has been used as an antirheumatic, with excellent results in some cases. With this, as with many other remedies, there are special symptoms indicating its use. If these are found in any disease, the remedy becomes specific. Thus in rheumatism, if there is a tendency to edema, even slight puffiness of the skin, or a peculiar blanched, glistening appearance, the apocynum will be found a valuable remedy.

"Following these indications I have used it with excellent results in some chronic diseases, especially where pain was a prominent symptom.
"I have already spoken of it as a remedy for menorrhagia. It will also be found a valuable remedy in chronic metritis, with uterine leucorrhea. In one case with profuse watery discharge from the uterus, it proved curative after other plans of treatment had failed." (Scudder.)

"To say that apocynum is a specific in all cases of dropsy would be ascribing to this agent more than can be said of any agent in the materia medica. We believe in specifics only as they correct specific pathological wrongs; and since there are varied conditions in this as in all disease, no one agent can meet all conditions and prove to be specific for the disease.

"We divide dropsy, whether idiopathic or symptomatic, into active and passive, the two conditions being directly opposite; the treatment for the one would not be beneficial in the other, but might prove harmful. In active dropsy we have the quick, hard pulse, irritation of the nervous system, dry, furred tongue, dry skin, scanty secretion of urine, with constipation.

This form is usually the sequel of fevers or inflammation, or occurs during their progress, and may show itself quite rapidly, first in the eyelids, face and upper extremities. In this case we select the proper sedative, aconite or veratrum, to control the circulation.

We may associate with these the specific tincture apocynum in the small dose-ten drops to half a glass of water. As the pulse comes down, the irritation of the nervous system gives way, the skin becomes relaxed, and we have the system prepared for the administration of diuretics. In this case, to begin the treatment with the decoction of apocynum, or any other diuretic, would be worse than useless.

"The large majority of cases, however, that the physician is called to treat, is passive; whether as anasarca, ascites, hydro- pericardium, hydrothorax, or wherever it may be. we find enfeebled functional activity-the circulation feeble, the surface cool and pallid, skin doughy and relaxed, deeply pitting on pressure, but cold, with marked edema, urine scanty and high-colored. It is in these cases that the decoction of apocynum is the remedy par excellence. The tincture is not so efficient in these cases. As a diuretic and hydrogogue cathartic it has no superior. To two ounces of the fresh crushed root add one pint of water, and boil until there is six or eight ounces of the decoction. Strain, and add half an ounce of alcohol or glycerine, as fermentation soon takes place. Of this give five drops every four hours, gradually increasing the dose as the patient is able to retain it, till the maximum dose is reached, namely, a teaspoonful four times per day. Some patients cannot take or retain more than five or ten drops at a dose; but even here the remedy is efficient, though not so much so as where they are able to take the large dose. If it act too freely on the bowels, lessen the size or frequency of the dose.

"Even when the dropsy is the result of disease of the heart, its action is very marked. I do not mean to say that it will cure where there is structural heart disease, but it will carry off a large quantity of water by way of the kidneys, relieve the difficult breathing, and permit the patient to sleep." (Thomas.)

"The specific action of apocynum is upon the blood-vessels and heart, restoring their natural functions when the former are in that condition that readily allows of transudation of serum into the tissues. It is scarcely necessary to allude to the fact that such a condition is one of debility. It is a remedy for effusion when due to obstruction of the circulation. This condition may be known by the puffy eyelids, the swollen legs and ankles, the distended scrotum and the ascitic abdomen, all of which pit upon pressure. The skin is tight, smooth and glistening, usually blanched, but may show pinkish streaks. If such disordered condition depends upon incurable or malignant diseases of the heart, liver or kidneys, a cure cannot be expected, but in most instances an amelioration of symptoms, and particularly a notable decrease of the watery accumulations, may be reasonably hoped for.

But in functional disorders with watery infiltration, and due chiefly to vascular weakness, it is a remedy that will prove its worth to the most skeptical. It matters little whether edema accompanies rheumatism, sciatica, arthritis, renal or hepatic obstruction, or the congestive pelvic ailments of women, the edema disappears and the concomitant disorder is invariably benefited by apocynum in small doses. In certain cardiac disorders, both organic and functional, it accomplishes great good, as is shown by the results of its use in mitral and tricuspid regurgitation, with rapid and feeble cardiac action, low arterial tension, cough, dyspnea, pulsating jugulars, general cyanosis, high-colored urine and general dropsy. The chief indication, then, for apocynum is watery infiltration of the tissues, with weak circulatory action and general debility.

Others are: Skin. blanched, full, smooth and easily indented; puffiness under the eyes; wrinkling of the lids, as if the parts had recently been swollen; feet full and edematous, pitting upon pressure; constipation, with edema; urine scanty and circulation sluggish; profuse and long-continued menorrhagia; boggy, watery uterus; full, relaxed uterus, with watery discharges; passive hemorrhages, small in amount and associated with edema; mitral and tricuspid regurgitation, with rapid and weak heart action, low arterial tension, difficult breathing, cough, and tendency to cyanosis." (Felter.)
Apocynum cannabinum is diuretic, diaphoretic, alterative, tonic, cathartic, emetic and vermifuge. In very large doses it causes vomiting and large watery discharges from the bowels, with general perspiration.

Indications.-Edema of cellular tissue; swelling of the feet; fullness of the eyelids and puffiness under the eyes; copious yellow or brownish diarrhea.

Dose.-Fluid extract, 1 to 20 drops; specific medicine 1/2 drop to 20 drops.

Usual Prescription.-A, Apocynum, gtt. x to 3 i; water, K iv. M. Sig. Dose one teaspoonful every three hours.

Apomorphinre Hydrochloridum-Apomorphine Hydrochloride.

In all cases in which prompt emesis is necessary apomorphine is the most efficient drug known to the medical profession. In from five to twenty minutes after it has been administered—according to the amount used and the manner of its employment—vomiting occurs, and in some instances is repeated three or four times at intervals of fifteen or twenty minutes.

The emesis is preceded and attended by but slight nausea and followed with little depression. Apomorphine is a direct or systemic emetic, and in so far as its systemic action is concerned it should always be remembered that it is a derivative of morphine. One of its great merits, in addition to its rapidity of action, is the ease with which it can be administered in cases where swallowing is difficult or impossible. It is, therefore, exceedingly useful in cases of poisoning. In morphine poisoning, however, it is contra-indicated. An occasional case of poisoning is seen in which the vagus is so blunted by the poison that apomorphine fails to produce emesis. In acute inflammation of the stomach, whenever an emetic is required, this drug is preferable to any other emetic. When given as an emetic apomorphine should always be administered hypodermically, and the solution should always be freshly prepared. Like some other systemic emetics—ipecac, for instance—apomorphine in very minute doses will often relieve persistent vomiting.

In acute bronchitis apomorphine, in doses of 1-40 grain to 1-20 grain, given by the mouth, is a very efficient remedy. It is also exceedingly useful as a means of relieving the dry, hacking cough of chronic bronchitis, chronic catarrhal pneumonia and tuberculosis. When used as an expectorant it should always be given by the mouth. In administering the drug to children a considerable care should be exercised, as they do not always bear it well.

Large doses of apomorphine stimulate the brain, and have even caused delirium. It has frequently caused unconsciousness, and in some cases convulsions have been produced by very large doses. Small doses have no marked effect upon the circulation, but full doses increase the rapidity and force of the heart's action. Toxic amounts of the drug depress the circulatory system or paralyze the cardiac muscle. Small doses do not affect the respiratory movements, although the secretion from the bronchial membrane is increased.

Full doses increase and deepen respiration, but toxic doses cause a depression like that caused by morphine.

Apomorphine is readily absorbed, and is excreted through the gastro-intestinal tract as well as by the broncho-pulmonary membrane, the kidneys and the skin.

The symptoms of poisoning by apomorphine are violent vomiting, delirium or convulsions, and cardiac and respiratory depression, death resulting from asphyxia. The approved treatment for this form of poisoning is the same as that employed in poisoning by morphine.

Apomorphine is an expectorant and a reliable emetic.

Indications.-Apomorphine is a certain and speedy emetic, causing vomiting in from five to twenty minutes, and without nausea or any general symptoms. Its subcutaneous use is preferred in all cases in which a speedy emetic is indicated, as in laryngeal croup and in narcotic poisoning, or where the use of the stomach pump is inadvisable. For cutting short epileptic attacks, a hypodermic injection may be given immediately upon the appearance of the aura.

Dose.-The maximum doses of apomorphine are as follows: 1-20 to 1-10 grain by the mouth; 1-25 to 1-6 grain hypodermically; 1-30 grain as an expectorant; 1-10 grain as an emetic.

Aralia Hispida-Dwarf Elder.

Dwarf elder exerts a very decided influence upon the circulation, and probably acts through the sympathetic nervous system. Its action upon the secretions is unmistakable. It quiets irritation of the urinary tract and increases the flow of urine. In anasarca and ascites it has often been employed with corrective results.

"Aralia hispida is an active remedy and worthy of close attention. Its chief action is as a diuretic, and in this line it is in certain cases the equal of apocynum and some other noted hydra-
gogues. When given in too large doses it is emeto-cathartic. It is also said to have some alterative properties. We doubt whether it is any more alterative than any remedy that rights some of the wrongs of the body, allowing the body to do its own house cleaning and repairs.

"Dwarf elder is a remedy usually in chronic disease. It is an excellent agent when dropsy of the cavities of the body is a resent.

It will carry away an immense amount of water, both through the urinary apparatus and by overcoming any torpor of the bowels that may be present, relieving the body of a great amount of fluid through this channel. It may be aided materially by simultaneous administration of cream of tartar.

"Dwarf elder is a most excellent remedy in many cases of irritation of the urinary apparatus. Though an active diuretic, unlike some other remedies, it relieves, instead of producing irritation of the urinary tract. This adds much to its value as a medicament. It is a remedy for suppression of urine; for this use it is the equal if not the superior of santonin. It may be given to children as well as adults. Dwarf elder has been recommended as a remedy for scrofula and syphilis. In our opinion, it is of little avail beyond its diuretic effect, as set forth above. Two drachms of the specific medicine are to be added to four fluid ounces of water. Of this mixture the dose is a teaspoonful every three hours. The infusion of the fresh shrub is the equal of alcoholic preparations generally. Cream of tartar or any other diuretic may be used in combination or alternation with aralia hispida."

Aralia hispida is diuretic, alterative, cathartic and emetic.

Indications.-Dropsy of cavities; irritation of the urinary apparatus.

Dose.-Fluid extract, 5 to 20 drops; specific medicine, 5 to 20 drops. Usual Prescription.-A Aralia, 3 ii; water, K iv. M. Sig. Dose one teaspoonful every three hours.

Aralia Racemosa-Spikenard.

Aralia has a special affinity for the respiratory organs, and has long been used with much success in chronic pulmonary diseases. In asthmatic breathing and in the early stage of bronchitis it is a useful remedy. In chronic catarrh, some forms of rheumatism, and enlargement of glands, its action is also satisfactory.

In chronic complaints of the uric acid and gouty diathesis, and in syphilis, it increases waste, aids in the removal of morbid products from the system, and gives tone to all the organs.

"Its sphere seems to be essentially in the pulmonary field. It is a most excellent remedy for cough when it is wheezy and accompanied by constriction of the chest and the expectoration of much tough, stringy mucus. It can be given alone, or it may be combined with, or alternated with, other so-called cough remedies that are indicated. However, one remedy, rightly chosen, is the best remedy, and the day will come when only one remedy will be given at a time. We hope to live to see that day."

"Spikenard is an excellent remedy for the irritation of the mucous membrane so frequently found in chronic pulmonary affections. It is a remedy for bronchial catarrh, bronchitis and chronic pneumonia.

"Spikenard has been recommended as an alterative in rheumatism, syphilis and in phthisis, and in chronic skin affections, but we believe there are better remedies for these affections."

Indications.-Acrid leucorrhea with offensive odor; suppression of menses from cold; suppression of the lochia, with pain in the uterine region; indolent and fetid ulcers; dysmenorrhea; scrofulous enlargement of glands; chronic catarrh; irritation of the bladder with scanty urine; dry, wheezing coughs, with difficult inspiration; sense of suffocation and soreness behind the sternum; cough and irritation of mucous surfaces in chronic pulmonary and catarrhal affections.

Dose.-Fluid extract 5 to 40 drops; specific medicines to 40 drops. Usual dose.-10 to 15 drops.

Areca Catechu-Betal Nut.

This remedy has been highly recommended as a means of expelling tape worms. It has also been employed as a vermifuge for young dogs, in doses of two drops of the fluid extract for each pound of the animal's weight. Whether used as a vermifuge for human beings or animals, the bowels should first be cleansed by fasting and castor oil.

Indications.-Tape worms; intestinal worms in man or animals.

Dose.-Fluid extract, 1 to 2 drachms. The dose given is that required for the expulsion of worms.

Argenti Nitratus-Nitrate of Silver.

The solution given in the "Usual prescription" should be used with care, as it will stain the lips and teeth. Externally the nitrate of silver is considerably used in from 1 to 5 per cent. solutions.

Subacute and chronic catarrh of almost all the accessible mucous membranes, ulcers of the
mucous membranes, and sluggish ulcers with bleeding granulations, are among the most common conditions calling for the local use of this agent. The nitrate of silver is tonic, astringent, antispasmodic and escharotic. In large doses it is a corrosive poison, destroying the tissues with which it comes in contact.

Indications.-Chronic diarrhea, with discharges of pinkish mucus streaked with bright blood; chronic intestinal catarrh; gastric ulcers, dysentery; gastralgia.

Dose – 1-12 to 1/2 grain, form one to three times a day, in pills.

Usual prescription—A Nitrate of silver, gr. iv., water, K iv, M. Sig. Dose one teaspoonful every two hours.

Aristolom-Aristol

Aristol is an antiseptic which favors cicatrisation, and is often used as a substitute for iodoform.

Indications:-Externally (in 3 to 10 per cent ointment with Vaseline); varicose ulcers; parasitic eczema of the thighs; lupus exulcerans; soft chancre; psoriasis; mycosis capillarum; tertiary syphilitic ulcers. Insufflation (the pure powder): rhinitis; nasopharyngitis; laryngitis; specific ozena. After the insufflation a tampon impregnated with a 10 per cent ointment should passed into the nostril.

Arnica Montana-Leopard’s Bane

This agent is useful in all conditions in which a spinal stimulant is needed. It is a remedy of value in diseases where there is a lack of ability to control the urine and feces, and it often exerts a corrective influence in anemias, when no inflammatory symptoms are present.

Arnica is said to be a very efficient remedy in amaurosis, or paralysis of the optic nerve. In low forms of typhoid fever, diarrhea and dysentery it is often employed with marked advantage, and in pneumonia with dry tongue covered with foul mucus, accompanied by great depression, and low muttering delirium, it affords marked relief. It is also a remedy of usefulness in hectic fever, especially when there is colliquative sweating or diarrhea, and in muscular soreness from strains or overexertion it constitutes a very reliable medicament. In gout and rheumatism, especially when the pulse is very slow and weak, it is a useful drug, and in nervous headaches it is often used with advantage.

As a local application in strains and bruises, arnica is a very efficient agent.

"Arnica is a specific stimulant to the spinal nervous system and will be found useful where there is want of innervation form this. I have seen most marked benefit from it in advanced stages of disease, where there was feeble respiratory power; difficulty of sleeping from impeded respiration; want of control over the discharge of urine and feces, etc., evidences of impairment of spinal innervation. In such cases its beneficial influence may be noticed in a few hours.

"I have frequently prescribed it for lame back, backache, and feelings of debility and soreness in the small of the back. It is only useful in those cases where there is feebleness, with deficient circulation; but in these the influence is direct and permanent." (Scudder.)

"It is as an internal remedy that we especially desire to recommend arnica in this paper. Like many others of our best remedies, when given in excess it is an acro-narcotic poison, producing vomiting, convulsions, great cardiac depression, muscular weakness, slow and shallow respiration, death. Its antagonists, hence its antidotes, are atropine, ammonium, alcohol, opium and camphor.

"Small doses of arnica stimulate digestion. Large doses cause nausea, vomiting and diarrhea. Small doses are tonic to the heart's action, while large doses depress the circulation and lower the temperature. Small doses act kindly upon the nervous system, while large ones cause severe headache, depression, paralysis, coma, convulsions and collapse. Small doses stimulate or accelerate respiratory efforts; large ones depress them.

"As a medicament, then, in doses of a proper size, we will say that arnica is the indicated remedy when we desire a stimulant to the cerebro-spinal nervous system; when we desire an increase in the functional activity of the whole urinary tract; when the heart and the skin both need stimulation. It will, then, be especially beneficial in any disease, and particularly in the advanced stages of many diseases, when there is coldness, depression, want of respiratory power, and even a loss of control over the sphincters guarding the excretory outlets of the body. In milder conditions arnica is the remedy in any disease when there is an unpleasant or even extreme soreness or tenderness about a part or any of the tissues, as though they had been bruised, and this sensiveness is aggravated by touch or motion.

"With these ideas of the use and action of arnica constantly before us, it becomes a most efficient remedy in the treatment of those cases of headache accompanied by depression, etc.
In pneumonia of an asthenic type, with enfeebled circulation, coldness of extremities and surface, etc., give arnica internally in small doses, and especially if it be accompanied by typhoid conditions, great exhaustion, and there is an absence of expectoration. In mania, delirium tremens, and other nervous disorders where there is an absence of excitement and there are present feebleness, coldness and depression, arnica will prove its activity as a remedy if properly given. The same may be said of it if it be given in diarrhea or dysentery with these conditions existing, and the discharges are large and of foul odor.

"Arnica is the same efficient remedy in hectic fever, in so-called 'putrid fever' when there is depression-dry tongue, nausea, slimy, foul emesis-a complication of unpleasant gastric disturbances. Arnica is a most valuable remedy in the exhaustion due to sexual excesses or abuse when accompanied by the characteristic depression. We believe that in many cases it is superior as a remedy to the vaunted phosphorus, and we are sure that it is much more pleasant to take.

"We would suggest the use of arnica in fair-sized doses as a part of a 'whisky cure' formula, or that it be given alone for the cure of drunkenness. It would certainly be indicated in the exhaustion and depression that follows continued or severe epistaxis or hemoptysis, or any other passive hemorrhage. Arnica, owing to its stimulating effects, both local and general, will give direct results in the treatment of paralysis of the bladder following rheumatism or other depressing maladies. Its administration will lessen the amount of urea in the urine and prevent uremic intoxication. It is also highly praised as a remedy for amaurosis.

"Give arnica internally in any disease in which there is depression, pain, soreness, etc., and especially in the treatment of minor ills like sprains, contusions, backaches, dysmenorrhea, amenorrhea, acute or chronic metritis, etc., and you will certainly be pleased with the results that follow.

"The internal use of arnica is contraindicated by an excited nervous system, by any gastrointestinal inflammation, by fatty or valvular heart troubles, and by asthmatic conditions.

"When it comes to the recommendation of arnica as a local remedy, we are in doubt whether it adds at all to the efficacy of the rubbings, and the alcohol carrying it, or to the heat and moisture, when the infusion is employed. However, many of much greater experience highly extol its virtues in this respect.

This is sure, its local use provokes in some people violent cutaneous inflammations and even marked constitutional symptoms. "It has more or less reputation among all physicians as a localapplication to sore nipples, bruises and sprains, and external inflammations generally. It has had too general an application. We would limit its local use, as we do its internal administration, to those cases only in which there is no fever or active inflammatory manifestations. Certainly a distinction between sedatives and stimulants is just as necessary in outward or local medication as it is in the internal use of remedies." (Bloyer.)

Arnica montana is stimulant, diaphoretic, diuretic, emmenagogue and narcotic.

Indications.-Shortness of breath from intercostal pain; bruises from blows and falls; acute superficial inflammations, as in boils; diseases characterized by debility, torpor and inactivity; prostration resulting from injuries; any condition showing depression.

Dose.-Fluid extract, 1 to 10 drops; specific medicine, 1 to 10 drops. Usual prescription.-A. Arnica, gtt. v. to x, water, K iv. M. Sig. One teaspoonful every hour or two.

Arsenici Iodidum-Iodide of Arsenic.

The iodide of arsenic often constitutes a much needed medicament. In nasal catarrh it exerts an improving influence, and in hay fever it has been used with beneficial results. It is also deemed a remedy of value in influenza, and in otorrhea and corrosive leucorrhea it is corrective in its action. The iodide of arsenic combines the effects of arsenious acid and iodine, and in its use great caution should be exercised. It is nervine and alterative. In large doses it is a violent poison.

Indications.-Irritating and corrosive discharges of the mucous membranes; dry scaly conditions of the skin.

Dose.-1-24 to 1/8 of a grain.

Usual dose.-1-100 of a grain in a pill or tablet.

Arsenitis, Liquor Potassii-Fowler's Solution.

In intermittent fever, when the tongue is dry and pointed, arsenic in minute doses is a curative agent of great power. It is also a good remedy in chorea, epilepsy, neuralgia and cardia-algia. Chronic skin diseases, especially psoriasis, old and extensive eczemas, and all chronic skin diseases characterized by infiltration of the cellular tissue and scale formations, are successfully treated by the
judicious use of small doses of arsenic. It is also a superior remedy in non-inflammatory diseases of the respiratory and digestive mucous membranes or their nerve supply, such as atonic diarrhea, chronic catarrh of the bronchi and the pulmonary mucous membranes.

"The arsenical fever bears a very close resemblance to quinism, or quinine poisoning, in its symptoms, though there is not, in a majority of cases, such disturbance of the nervous system. There is also a difference in the termination, for whilst in quinism there is continued dryness of skin and scanty high colored urine, and finally death from uremia, in chronic poisoning by arsenic there is finally a stage of relaxation, and through there is dropsy, the skin and kidneys act freely.

"We have long since determined that the mere matter of dose in medicine might be the difference between a poison and a remedy. If, for instance, we give one grain of strychnia, we poison our patient, whilst if the dose had been but the fortieth or thirtieth of a grain, it would have proven a vital stimulant. If we administer five grains of morphia, the result is death; whilst a medicinal dose of one-fourth of a grain would have produced refreshing sleep. If we give large doses ofaconite (say five drops of a tincture of the root), frequently repeated, it increases the frequency of the pulse, impairs the circulation, and irritates the nervous system. But, in medicinal doses, it lessens the frequency of the pulse, gives freedom to the circulation, and relieves irritation of the nervous system. If we give large doses of veratrum, it impairs the circulation, arrests vital processes, and produces death; whilst medicinal doses give increased freedom to the circulation and diminish the frequency of the pulse.

"It seems strange to me that these things have not had due consideration, and that the remedial action of drugs has not been kept distinct from their poisonous effects when given in large doses. We have already seen that the dose of medicine should be the smallest quantity that will give the desired influence, and that in a rational system of medicine, its influence should always be to restore normal function, and not as a disturbing element.

"There is another view of this subject which is important in this consideration. A drug which may be poisonous in health, or in some conditions of disease, will be curative in other conditions of disease. Thus we regard the disease as antagonizing the remedy, quite as much as the remedy antagonizes the disease, and the influence is toward the restoration of healthy function.

Give a healthy man almost any of our common medicines, and after a time he will become diseased, the disease being of that kind and of that part which the medicine cures. Thus, if we give quinine to cure malarial fever, its influence is kindly, but if there is no malarial disease it causes irritation of the nervous system. If we give belladonna when there is an enfeebled capillary circulation, the influence is kindly and curative, but it is the reverse if we already have capillary spasm.

"This is especially the case with the more powerful remedies, with which arsenic should be classed, and they should never be employed unless, the symptoms indicating them are very distinct.

"In small doses, and when indicated, arsenic may be regarded as a vital stimulant, and one of the most powerful of this class. But we must not forget that the dose must be small, and there must be specific indications for its use. What are these indications?

"In that condition of the blood, and of nutrition, where there is a tendency to the deposit of a low or imperfect albuminoid material-yellow tubercle, caseous deposits—or degeneration of tissue, arsenic may be used as a blood-maker, and especially to improve nutrition.

"A class of skin diseases depending upon such deposits, or on enfeebled nutrition, is cured by arsenic. Among these are the more chronic affections—the squamae, the chronic vesiculae, some of the pustulae, and the tuberculae. It will not cure all cases, it will do harm if injudiciously used, but it affords relief in many otherwise intractable.

"But, it should never be employed where there is irritability of the nerve centers, and especially of the sympathetic. This rule I think is absolute, and must be constantly regarded. Arsenic is a nerve-stimulant,' quite as much so as phosphorus, with this addition—its action is greatly intensified when there is already erythism of the nerve centers.

"Arsenic may be employed in the treatment of some cases of intermittent fever with excellent results. They are those marked by impairment of sympathetic innervation, and with a general want of nervous excitability. The dose should be very small, gtt. v to x of Fowler's solution to K iv of water; a teaspoonful every two or three hours. I have used the Homeopathic pellets, medicated with Fowler's solution, and though the dose was not more than the twentieth to the one-hundredth of a drop, the effect was marked, where specially indicated.

"It is also used with advantage in atonic diarrhea, with indigestion, the conditions being as above named. Especial benefit has been observed in those cases in which there were periods of great depression, followed by hectic fever.

"I need hardly say in conclusion that arsenic is one of those agents that will do either good or
harm. Good if given in the proper case, and in medicinal doses; harm if not indicated by special symptoms, or contra-indicated as above named, or if given in poisonous doses." (Scudder.)

Arsenic in small doses is a vital stimulant, tonic, nerve, alterative and antiperiodic. In large doses it is a violent poison.

Indications.-Imperfect nutrition, with glandular deposits; degeneration of tissue; tendency to the deposit of low or imperfect albuminoid material; skin diseases depending upon enfeebled nutrition; epidermis dry; skin inactive and lacks elasticity; eczematous eruptions; dry and pointed tongue; cardia.

Dose.-3 drops three times a day, gradually increasing to 10 drops three times a day. Usual prescription.-A. Fowler's solution, gtt. v to x, water, K iv. M. Sig. Dose one teaspoonful every two or three hours.

Artemisia Absinthium-Wormwood.

Artemisia is sometimes employed in atonic dyspepsia with good results, and in flatulent colic it is often used with advantage.

It is deemed all efficient agent for the removal of lumbricoides and other worms. In intermittent fever its influence is exerted in a curative direction. Wormwood undoubtedly possesses decided medicinal properties.

"When given in moderate doses wormwood promotes the appetite and digestion, quickens the circulation and imparts to the whole system a strengthening influence. It is given in all cases requiring the administration of tonics; in dyspepsia and other atonic states of the intestinal canal, in certain cases of amenorrhea, chronic leucorrhea, and in obstinate diarrhea, depending upon debility of the membranes of the intestines. It is often administered in intermittent fevers with complete success. It is likewise given as an anthelmintic." (Beach.)

Artemisia absinthium is tonic, antiperiodic, anthelmintic and narcotic. In very large doses it frequently irritates the stomach and increases the action of the heart.

Indications.-Loss of appetite in atonic dyspepsia; amenorrhea; chronic leucorrhea and obstinate diarrhea; intermittent fever; jaundice; intestinal worms.

Dose.-Fluid extract, 5 to 60 drops.

Usual dose -5 to 10 drops.

Arum Triphyllum-Indian Hemp.

Indian turnip has been used with satisfactory results in chronic laryngitis, and in bronchitis its influence has been deemed beneficial. In asthma and whooping-cough it is also a useful remedial agent, and in affections connected with a cachectic state of the system it has often been employed with good results.

Arum triphyllum is expectorant, diaphoretic and stimulant to all the secretions, especially those of the skin and lungs. Externally it is an irritant.

Indications.-Sense of fullness, and swelling of the throat and tongue; difficult expectoration, owing to an enfeebled or atonic condition of the respiratory apparatus; severe sore throat with bleeding and marked fetor; inflammatory swelling of the tissues of the mucous surfaces of the mouth, fauces and air passages, with pricking, stinging pains and burnin 5iv g discharges; non-inflammatory affections of the same parts when the tissues are relaxed and full, or secreting profusely; hoarseness and rawness in the larynx, especially in public speakers.

Dose.-Fluid extract 10 to 30 drops

Usual prescription-A. Arum triphyllum, gtt. x, water, 3iv. M. Sig. Dose one teaspoonful every hour or two.

Asarum Canadense-Wild Ginger.

Wild ginger has a stimulating influence on the mucous lining of the intestinal tract and on the skin. It also stimulates the muscular structure of the womb. It has been employed as a parturient and in amenorrhea, and with satisfactory results.

Asarum canadense is stimulant, diaphoretic, expectorant and carminative.

Indications-Colic and other painful conditions of the stomach and bowels, when there is no inflammation; chronic pulmonary affections; dropsy accompanied by albumin in the urine.

Dose: Tincture, 30 to 60 drops.

Asclepias Curassavica-Blood Flower.

This agent has been employed in gonorrhea and gleet with curative results, and in bleeding hemorrhoids it is often used with advantage. The juice of the plant has been employed as an enema in
hemorrhage from hemorrhoids. The leaves will check capillary hemorrhage when bound on a recent wound.

Asclepias curassavica is astringent, styptic and vermifuge.
Indications-Capillary hemorrhage; hemorrhage from hemorrhoids; gonorrhea, gleet and vaginal leucorrhea; intestinal worms.
Dose.-Fluid extract, 30 drops to 2 drachms.
Usual dose.-30 to 60 drops.

Asclepias Incarnata-Swamp Milkweed.
"Swamp milkweed often promptly relieves the general distress caused by extreme infiltration of the tissues in dropsy. It strengthens the heart and markedly modifies the dyspnea. It is also a good remedy when there is pain in the chest and threatened inflammation of the lungs and pleura. In rheumatism from cold it is a remedy of considerable relieving power, and in chronic catarrh of the stomach it has often been employed with satisfactory results.

As a diuretic in dropsy this drug is of considerable value. It strengthens the heart and often relieves the distress caused by infiltration of the tissues, especially the difficult breathing. "From the fact that it acts as a diaphoretic it is recommended as a remedy for coughs, colds, and rheumatic troubles of an atonic nature, and from the fact that it increases heart action it is highly recommended as a remedy for dyspnea, lung infiltration and asthmatic troubles. As a remedy for catarrh it lessens discharges and gives tone to the mucous membranes. It is a remedy for chronic nasal catarrh, leucorrhea and other below-par mucous fluxes.

"It is also a remedy for amenorrhea, and is said to be superior to asclepias tuberosa as an emmenagogue. It has been declared that it will produce abortion, but I doubt this statement." Aclepias incarnata is diuretic, stomachic, anthelmintic, and, in very large doses, emetic.
Indications.-Catarrhal discharges; chronic gastric catarrh; catarrhal inflammation of the respiratory organs; dysentery and diarrhea; leucorrhea; rheumatism from cold; dropsies.
Dose.-Fluid extract, 5 to 60 drops; specific medicine, 5 to 60 drops.
Usual Prescription.- R Asclepias incarnata, gtt. xx to 3 i; water,. M. Sig. Dose one teaspoonful every hour to every three hours

Asclepias Syriaca-Silk Weed.
This plant possesses decided properties which should be fully and carefully investigated by the medical profession. It has been too much neglected. If its action in coughs, dropsies, dyspepsia, asthma, scrofulous and rheumatic conditions, amenorrhea and many other wrongs of life, were thoughtfully observed and faithfully recorded, much valuable knowledge would unquestionably be obtained.

Asclepias syriaca is tonic, diuretic, alterative, emmenagogue, stimulant and anthelmintic. In large doses it is purgative and emetic.

Indications.-Insufficient secretion of urine and urine which is deficient in solids; suppression or retention of urine; primary syphilitic disease; congestive headaches from suppression of urine or sweat; nervous headache followed by sweating and excessive urination; acute rheumatic inflammation of the large joints; hepatic, renal and cardiac dropsy; dropsy following scarlet fever.
Dose.-Fluid extract, 5 to 60 drops.
Usual Dose.-5 to 20 drops in cinnamon water or other pleasant vehicle to cover its unpleasant taste.

Asclepias Tuberosa-Pleurisy Root.
The best results are obtained from asclepias when the temperature is but moderately increased, and the skin is inclined to moisture, although it is many times of value during high fevers. Asclepias is a remedy of marked curative power in a wide range of abnormal conditions, but its extreme freedom from injurious effects under all circumstances has led many physicians to think it lacking in therapeutic power. If, however, such practitioners will test it in a severe case of pleuritic pain, administering from fifteen to thirty drops of the specific medicine in hot water, a few doses thus employed will remove from their minds all doubt of its medicinal properties. No other remedy, under such circumstances, can equal its relieving effects. In pneumonia, pleurisy, bronchitis and other wrongs of the respiratory organs, asclepias is employed with splendid results. When administered early it often constitutes the only needed medication. As a means of removing the effects of la grippe it is one of our most efficient remedies. If the effects are characterized by nervousness, it quiets the nerves,
and if derangement of the stomach is a prominent feature, it relieves the stomach irritation, and thus makes for recovery.

In rheumatism asclepias exerts a decidedly corrective influence, and in nervous irritability its effects are markedly soothing in character. In insomnia, when given in hot water at bedtime, restful sleep is often secured through the influence of this medicament.

Coughs and colds also come within the curative range of asclepias, and in all forms of colic it can be prescribed with perfect confidence that its action will be positively beneficial. In all such cases it should be administered in very hot water—so hot that it has to be taken slowly. While asclepias does not interfere with the action of other remedies, it is usually better to employ it singly, and if other drugs are needed use them in alternation.

"When given freely, it is one of the most certain diaphoretics we have, providing the pulse is not frequent and the temperature increased. Even in the small dose of one drop, following the use of the special sedatives, it will markedly increase the true secretion from the skin.

"Recollect that there is a difference between sweating and secretion. There may be a profuse exudation of water, the surface being bathed in perspiration, and yet but little secretion. Excretion by the skin is a vital process, and takes place by means of secreting cells. It goes on best where the skin is soft and moist, and not when covered with drops of sweat.

"I employ asclepias in diseases of children, believing that it allays nervous irritability, is slightly sedative, and certainly increases the secretion from the skin. I use it with veratrum and aconite, in febrile and inflammatory diseases, and in mild cases frequently give it alone." (Scudder.)

"No other remedy with which we are acquainted is so universally admissible in the treatment of diseases, either alone or in combination with other indicated drugs. In fact, we can think of no pathological condition that would be aggravated by its employment. It expels wind, relieves pain, relaxes spasm, induces and promotes perspiration, equalizes the circulation, harmonizes the action of the nervous system, and accomplishes its work without excitement—neither increasing the force or frequency of the pulse nor raising the temperature of the body. It is of especial service in the treatment of affections involving the serous membranes, as pleuritis, pneumonitis, etc. No one agent manifesting so little excitement in its operation is capable of successfully meeting so great a number of indications." (Grover Coe.)

"We desire to call attention to asclepias as a remedy for certain specific conditions or symptoms that cannot be met so well by any other remedy. known to us. In any disease in which we may have a hot skin, either dry or with a tendency to moisture, a flushed face, a full, or even bounding pulse, with sharp pain that may be worse upon movement, asclepias becomes an efficient remedy. It can be used alone or in combination with other indicated remedies. These symptoms frequently present in the early stage of catarrhal affections generally, in pneumonia, in pleurisy, in pleurodynia—in short, in chest affections particularly. Asclepias may be given with great reliance in pneumonia in the early stages, and especially in children. It may be given alone or in combination, or in alternation with other indicated remedies. It will act under these conditions as a synergist to any other indicated remedy. It is par excellence the child's remedy in chest affections. It deserves as much praise in the delayed appearance of exanthematous diseases, like rubella, measles, etc. Asclepias is also a remedy in bronchitis and consumption. It will lessen the cough, and free the secretions, and act as a sedative. In coughs generally, that are tight and dry and constricted, if the direct cause cannot be located, asclepias should have due consideration as a possible remedy.

"In rheumatism, especially of the costal variety, and in neuralgia with suppressed secretions and symptoms as above, asclepias is the remedy. The same may be said of it in asthma with dryness, difficult breathing and a sense of constriction.

"Besides in these chest troubles, asclepias is an excellent remedy in digestive disturbances. With the symptoms above named predominating, it is very efficient in dyspepsia; in headache due to gastric troubles; in diarrhea, from cold, catarrhal, especially in children; in dysentery; in enteritis, etc. It has received the highest praise as a remedy in the distressing flatulent colic of babies. It has also been highly recommended in cases of 'nervous irritability' of children presenting the above symptoms. For many cases of syphilis and-of scrofula, for gout, and for the colliquative sweating due to exhaustive diseases, asclepias should have a fair trial. The same may be said of it in certain forms of dropsy, and in some skin diseases when the skin is dry and scaly. By way of emphasis we will repeat that asclepias is an Eclectic standby in pneumonia, pleurisy, bronchitis, cough, etc. Cases must be selected properly and relief follows surely." (Bloyer.)

Asclepias tuberosa is diaphoretic, diuretic, tonic, laxative, carminative and antispasmodic. In
very large doses it is emetic.

Indications.-Sharp cutting or darting pain, increased by deep breathing; pain acute, and seemingly dependent on motion; lack of secretion from the skin; snuffles, or acute nasal catarrh of infants; flatulent colic in young children.

Dose.-Fluid extract, 1 to 60 drops; specific medicine, 1 to 60 drops.

Usual Prescription.-A Asclepias, gtt. x to .3ii; water, 5iv. M. Sig. Dose one teaspoonful every hour.

Asparagus Officinalis-Asparagus.

This remedy possesses diuretic properties of a considerable value, and has been employed with advantage in various forms of dropsy. It has also given marked relief in some cases of enlarge-ment of the heart.

Asparagus officinalis is a gentle but certain diuretic.

Indications.-Undue excitement of the circulatory system; dropsical conditions.

Dose.-Fluid extract, 20 to 60 drops.

Usual Dose.-20 to 30 drops.

Aspidium Filix-Mas-Male Fern.

Male fern is a specific for tapeworm. It is supposed to cause the removal of the parasite through its power as a gastro-intestinal irritant.

Indications.-Symptoms of tapeworm.

Aspidium filix-mas is anthelmintic, tonic and astringent

Dose.-Fluid extract, 1/2 to 2 drachms; oleoresin, 6 to 8 grains.

Usual Dose.-One-half to one drachm of the fluid extract at night and again in the morning before breakfast. Two hours after the administration of the last dose a saline or vegetable cathartic should be given. It is claimed by eminent writers that oils should not be given after this agent, as they facilitate the absorption of its toxic principle.

Aspidosperma Quebracho-Quebracho.

Quebracho is recommended by many physicians as a remedy for dyspnea. It relieves the cyanosis and sense of suffocation due to embarrassed respiration, as in emphysema, capillary bronchitis, phthisis and chronic pneumatic processes. Its action is almost immediate, and one or two doses of thirty drops each have often afforded marked relief. Large doses sometimes cause nausea and slight salivation. Aspidospermine represents fairly well the activity of the drug, and is preferred by some physicians.

Aspidosperma quebracho is sedative, expectorant, astringent and antispasmodic.

Indications.-Asthmatic attacks and cyanosis in phthisis; short and labored respiration; cough and difficult respiration in phthisis; attacks of dyspnea due to dropsical accumulation in the abdominal cavity; difficult respiration in bronchial catarrh and emphysema; cough and dyspnea increased by exertion; paroxysms of dyspnea with wheezing sounds; dyspnea accompanying heart diseases; spasmodic asthma; diarrhea of consumptives.

Dose.-Fluid extract, 15 to 60 drops; solid extract, 1 to 3 grains; aspidospermine (consisting of the alkaloids of the bark), 1-500 of a grain to 3~ of a grain, triturated with sugar of milk.

Atropre Sulphas-Sulphate of Atropine.

The properties of this drug are substantially the same as those of belladonna, but it is much more speedy in its action. It may be employed internally and subcutaneously. For the latter use the dose is from the 1-300 to the 1-128 of a grain. In ophthalmic practice atropine is extensively employed. It is used in iritis to prevent adhesions, and is employed to dilate the pupil so that the interior of the eye may be examined. Morbid adhesions may be broken up by its use. For these purposes it must be applied directly to the eye in a solution of from two to four grains in one ounce of distilled water. This solution in doses of from two to five drops is a very good form in which to administer the drug for its systemic effects. Atropine is incompatible with caustic alkalies, tannin and vegetable infusions containing tannin, an insoluble tannate of the alkaloid being formed.

Dr. Edward T. Reichert, from a long series of experiments, concludes that atropine may be of value as an antidote in morphine poisoning, but only before the third stage, and then only when given in small or moderate doses. Even here its usefulness is practically limited to a possible excitation of the respiratory movements and a stimulation of circulation, both of which, however, may be fully compensated for in its pernicious effects, chiefly upon general metabolism.
Given in large doses during the second stage, or in moderate to large doses during the third stage, it almost without exception does harm by intensifying the morphine condition, prolonging or shortening, but intensifying the second stage, or shortening the third stage and hastening the fatal issue. If the second stage is shortened, it is owing to the earlier development of the third stage of the poisoning. A dose of morphine that is not lethal may be made so by the synergistic action of a sublethal dose of atropine. In using atropine great caution should be exercised. In human beings, if taken in large amounts, it is a powerful narcotic poison.

Indications.-Night sweats of phthisis; convulsions; whooping-cough; epilepsy; chorea; neuralgia; rheumatic pains; hemorrhage.

Dose.-1-100 to 1-60 of a grain.
Usual Dose.-1-100 of a grain, in pill, powder or solution.

Auri et Sodii Chloridum-Chloride of Gold and Sodium.
Whenever the therapeutic effects of gold are needed this preparation will constitute an excellent form in which to administer the agent.
A patient suffering from secondary syphilis, glandular disease or chronic disease of the skin, the tongue being moderately red and the circulation to the surface good, will often derive benefit from minute doses of the chloride of gold and sodium (one-sixtieth to the one-twelfth of a grain). It may be combined with a small portion of phytolacca. The chloride of gold and sodium is a powerful organic stimulant and alterative.

Indications.-Secondary and tertiary syphilis; locomotor ataxia; epilepsy; scrofulous conditions; hypochondria and mental depression; amenorrhea from torpor; disturbances of digestion and assimilation; sexual impotence.

Dose.-1-12 grain several times a day in aqueous solution or pill. Not more than three grains a day should be used. The solution should be kept in colored glass bottles.

Avena Sativa-Oat.
Avena exerts an influence which increases nerve force and improves nutrition of the entire organism. In paralysis and wasting diseases of the aged it is a useful medicament, and in chorea and paralysis it has been employed with beneficial results. In neurasthenia and nervous prostration it is an efficient remedial agent. The occipital headache which is often associated with general neurasthenia is promptly relieved by this drug, and in local paralysis of diphtheria it is an agent of decided merit. In the convalescence of prostrated disease, and during the asthenic stages of inflammatory and exantheinematous diseases, avena has been used with markedly beneficial results. Avena has a selective influence upon the genito-urinary organs, and it, therefore, often renders excellent service in wrongs of these organs. In impotency, especially in men under middle age, it is an agent of considerable value. In uterine and ovarian wrongs, with hysterical manifestations, it constitutes a medicament of more than ordinary merit, and in the nervous headaches which are often associated with menstruation it is a superior remedy. Avena is especially indicated in headaches accompanied by a burning sensation on the top of the head, and in sick headaches associated with nervous weakness its effects are promptly curative.

"Avena sativa is pre-eminently an anti-neurotic, quieting the nervous system to a remarkable degree. Its special sphere of action seems to be upon the male sexual organs, regulating the functional irregularities of these parts perhaps as much as any drug can. It is a most useful remedy in all cases of nervous exhaustion, general debility, nervous palpitation of the heart, insomnia, inability to keep the mind fixed upon anyone subject, etc., more especially when any or all these troubles is apparently due to nocturnal emissions, masturbation, over sexual intercourse, and the like. For these disorders it is truly specific. It is one of the most valuable means for overcoming the bad effects of the morphine habit. In most cases in which the habitue has not used more than four grains daily, the opiate may be abruptly discontinued, and even substituted, without any serious results.

If a larger quantity than this amount has been taken for some time, it is better to gradually reduce the daily dose of morphine, in the usual manner, simply prescribing the avena in addition. The latter should be given in the same dose, as a rule, regardless of the amount of morphine taken. In other words, it is not necessary to increase the avena as the opiate is withdrawn. When the quantity of morphine has not exceeded four grains daily, it should be stopped at once, as above stated, and avena given in its stead, in fifteen drop doses, four times a day, in a wine-glassful of hot water. By this method the disagree-able after-effects will be much less than if the dose of morphine is gradually reduced, and the patient will find life quite bearable, as a rule, at the end of a week.

"Avena sativa should always be given in appreciable doses of the tincture. Fifteen drops three
or four times a day, well diluted, will usually meet the case. It may be given in doses of from five to sixty drops, in rare instances." (H. E. Russell.)

"The prominent uses of avena sativa are as a nerve tonic, a stimulant and as an antispasmodic. The specific indications calling for its use are exhaustion or nervous prostration-neurasthenia, if you prefer it. It acts as a gentle stimulant and tonic, as a restorative to the depressed nervous system and vital energies.

"As a remedy, with such symptoms presenting, we prescribe avena sativa in the debility and insomnia that we find in debauchees who are reforming. A number of times we have given it to the 'sworn off' toper, and with good results. For the approaching delirium tremens we administer full doses of specific nux vomica and capsicum. When the immediate danger of the 'snakes' has passed, full doses of avena are given alone or in combination with other remedies. We have used it freely and frequently in those trying to relinquish the morphine and opium habits. Recently our experience with it, administered in full doses to a clinical patient of this kind at the Eclectic Medical Institute, was quite satisfactory. Occasionally we give it alone; frequently we combine it with other so-called nervines.

"Avena sativa is as frequently a remedy for the insomnia of nervousness-the overworked. It is harmless and efficient, and far better than opiates in these conditions. It is also a remedy in spermatorrhea when due to nervous exhaustion. It is a reliable remedy, prompt in action in many cases of nocturnal seminal emissions, in cases of nervous type. Avena is also an efficient remedy in the recuperating stage following typhoid and other exhausting or debilitating diseases. It has been highly recommended in certain forms of paralysis, and in cardiac rheumatism. The name of the disease is not so material as the conditions presenting. Nervous debility due to or accompanying any disease may be overcome by the judicious use of avena sativa.

"Quite frequently we advise that avena be taken in hot water. We cannot say positively that this adds to the virtue of the medicine as much as it makes an impression on the patient. The hotwater alone is likely to help materially in 'waking up' a feeble stomach and nervous system.

"As we have said above, we many times combine avena with other remedies. It is often a part of a prescription containing one or more substances, such as specific nux vomica, lupulin, staphysagria, gelsemium, saw palmetto, etc. We believe, upon the whole, that avena sativa is a remedy that deserves further study and consideration at the hands of the profession." (Bloyer.)

Avena sativa is a nerve stimulant of great power, diuretic, laxative, tonic, antispasmodic and resolvent. Indications.-Paralytic tendencies; pain in head, extending along spine and down the lower extremities; lack of control over the urinary organs; alcoholism; spermatorrhea; nervous prostration due to mental strain; opium and morphine habit; sleeplessness, with irritability; pain in occipital region extending into the neck and downward along the spine; vagary of thought and manner; neurasthenia; melancholia; hysteria; impotence from sexual abuses.

Dose.-Fluid extract, 5 to 60 drops; specific medicine, 5 to 60 drops.

Usual Prescription.- A Avena, 3i; water, giv. M. Sig. Dose one teaspoonful every two or three hours.

Baptisia Tinctoria-Wild Indigo.

Baptisia has long been extensively and successfully employed in typhoid fever and in all low states of the system in which there was a tendency to a typhoid or septic condition. When specific ally indicated and administered in small or medium doses it is one of our most reliable remedial agents. Strictly speaking, it is not a chemical antiseptic, but in the living human being it has the power to arrest the progress of certain destructive diseases, and greatly favors the restoration of healthy conditions.

For this reason some writers have termed it a vital antiseptic. Baptisia is a powerful vital stimulant, preservative and restorative in all states in which there is great loss of vital power. It improves the circulation in weak conditions and apparently dying parts, and at the same time exerts a decidedly beneficial influence upon the tissues involved. The cellular, muscular and nerve tissue, and the blood, are all restored to functional activity by its invigorating influence.

Indications for baptisia are frequently seen in continued; intermittent and remittent fevers, scarlet fever, dysentery, diarrhea, and in many other abnormal conditions.

"It is in those cases in which there is enfeebled capillary circulation and tendency to ulceration that it is specific. That is, the condition is one of atony, with tendency to molecular death and decomposition. The remedy is, therefore, stimulant and antiseptic.

"It may be employed with the greatest certainty in any form of sore mouth or throat presenting
the characteristics named. Especially in stomatitis ulcerata, or cancrum oris, in cynanchemaligna, and in the sore throat of scarlatina maligna; but it is not only a good local application in these cases, but a most valuable internal remedy.

"It is specific to the condition upon which such sore mouth and throat is based, whether it is manifested in this way, or in ulceration of Peyer's follicles in typhoid fever. Thus I have employed it with very marked advantage in all cases showing putrescency and tendency to softening and breaking down of tissue.

"It is not a remedy for acute inflammation, whether erythematous or deep-seated, and in ordinary stomatitis or cynanche it is not a remedy. In diphtheria, presenting acute inflammatory symptoms it is worse than useless. But in diphtheria with swollen and enfeebled mucous membranes, dusky or livid discoloration, or blanched appearance, with tendency to ulceration and sloughing, there is no remedy more certain.

"I have successfully employed the baptisia in typhoid dysentery, as have others. But, as will be seen, this is but the condition named above for its specific action. So long as there is an acute inflammation, with stools of blood or pure mucus, it is not beneficial, but when the discharge resemble prune juice, the washings of meat, or are muco-purulent, with general symptoms of an analogous character, then it becomes one of our most certain remedies." (Scudder.)

"Baptisia tinctoria has held a prominent place for many years in the Eclectic materia medica as an antiseptic, but of more recent date it has shared the honors with echinacea. Both, however, have their particular uses, and the one should not be discarded for the other, a practice too common in these days when a new drug almost daily displaces another. Both baptisia and echinacea are good general antiseptics, yet each has its specific indications pointing to different specific action and needs.

"Sepsis, then, is the keynote to the selection of baptisia, but this indication is governed by the peculiar appearance of the part affected, of the membranes, and of the patient as a whole. There is a peculiar duskiness of a bluish or purplish hue that points unmistakably to baptisia. It may be a swollen, bluish face, dark, swollen membranes, or an ulceration of indolent character, with bluish or purplish edges. When the tissues are full, with a sluggish capillary circulation and tendency to death and disintegration of the parts, baptisia is the indicated remedy. Active, acute conditions are not benefited, and are likely to be aggravated by baptisia. It is contraindicated by hyperemia; indicated by capillary stagnation. This is well illustrated in some cases of diphtheria.

The sluggish cases are those benefited by it. Baptisia is pre-eminently a typhoid remedy. Perhaps no remedy has been so popular among Eclectic physicians for its effects in this condition. Here, as elsewhere, the symptoms indicating baptisia are those of debility and tendency to destruction of the blood and the tissues. The baptisia patient has a swollen appearance, dusky color, a strong tendency to drowsiness, and the diarrhea is of the prune-juice variety, resembling, as Dr. Scudder wrote, the 'washings from raw meat.' Keeping these facts in view, baptisia may be confidently used in any disease, and particularly in septic conditions, in sore mouth and malignant forms of sore throat, in scarlatina, tonsillitis, typhoid fever, dysentery, pneumonia, typo-malarial fever, fetid sanius discharges from the genitalia, and in similar discharges from other parts. Briefly recounted, the indications are: Debility, with feeble capillary circulation; fullness of tissue, with dusky, leaden-hued, purplish or livid discoloration; tendency to ulceration and decay; color of skin disappears upon pressure; typhoid states; face swollen and bluish, like one having been frozen or long exposed to the cold; fetid, prune-juice-like discharges; tendency to gangrene." (Felter.)

"As a remedy baptisia has been variously classified as an alterative, a stimulant, an astringent, a purgative, an emetic, and as an antiseptic. Within our experience it has been all of these and much more. In overdoses it is an emeto-cathartic and should not be so used. In medicinal doses its most praiseworthy action is as an antiseptic, and through this property, when indicated as a remedy, almost any other end may be attained. As an antiseptic it will act as an antipyretic, as an astringent, as a stimulant, and as an alterative; as a laxative and as a diuretic.

"It is a dynamic anti zymotic, and, like echinacea, its effects are not in any respect of a chemical nature. That it does produce, under certain conditions, most marked effects, cannot be controverted. And it is just as true that when these conditions or indications are not present it has absolutely no effect upon the diseased conditions. The point we desire to emphasize is this: In one case of diphtheria, for instance, baptisia is a most excellent remedy, and no other medicine known will encompass half the good that baptisia will, while in the next case of diphtheria, when given in the same-sized doses and with the same regularity, but without the presence of the indications, its effects are entirely nil. We believe that this latter applies as well to the healthy body when medicinal doses are taken.
"Baptisia is the indicated remedy when there is a fullness of tissues, with a dusky, purplish-red discoloration of the tongue, mucous membrane, or general tissues of the body—an appearance resembling an exposure to severe cold. This color varies with the severity or malignancy of the disease to a deeper color, even to a red-violet, brown or black, and can be observed in the fauces and pharynx, as well as upon the part or organ affected, when it is within view; the breath is peculiarly fetid or foul; there is an unpleasant moistness or pasty nastiness about the mouth, with a tendency to sores on the teeth, gums and lips; there is a fullness of tissues and an expressionless face that show an enfeebled circulation; the pulse is full and oppressed; there is an unpleasant pungent heat of the surface when the open hand is placed upon it; the urine is frothy and bad-looking and of a bad odor; the stools are fetid and foul; everything about the patient is disagreeable, and every thing points to one word-sepsis. There is a tendency to ulceration, to decomposition and to molecular death.

"Baptisia is often a remedy in typhus and especially in typhoid fever. In the cases calling for it there is marked atony and depression, 'prune-juice' or 'meat-washings' discharge, a tendency to ulceration of the bowels, together with the baptisia indications above set forth. The same may be said of its use in severe cases of so-called typho-malarial fever. In this, besides the malarial impression, we have the well-known typhoid symptoms quite prominent. In diphtheria-bad cases, with a livid, blanched, purplish surface and expressionless face, the throat ulceration tending toward sloughing, and baptisia expressions predominating baptisia is a most excellent and active remedy.

"In dysentery, after the bloody stool and tenesmus stage has passed, and atony and typhoid prevail, and prune-juice, purulent, disagreeable discharges are the order, and the symptoms above enumerated are dominant, there is sepsis-baptisia is the remedy. In scarlet fever with bad blood, bad throat and bad everything, try baptisia. The same may be said of cynanche maligna, of stomatitis and of aphthous sore mouth.

"Many times 'typhoid' symptoms prevail in cases of mania, melancholia, dementia, stupor, etc.; when they do, and sepsis threatens, use baptisia with confidence. Use it in any disease in which it is specifically indicated. Generally, it is not called for in the acute stage, or in the stage of active inflammation, but later, when there is a waning of life's forces. The earlier you can see your baptisia indications and give it the better. Many times you will see them from the beginning. But do not give baptisia because at times it is a good remedy, when at this particular time a much better remedy might be given.

"Baptisia has been highly recommended as a local application, in the shape of a decoction or wash, or when incorporated in an ointment base, in putrid and gangrenous ulcers, when there is a tendency to sloughing, etc., and baptisia indications prevail. As a gargle or wash it is to be applied to mouth and throat affections; it may be used as a wash for ulceration of the uterus, or for foul leucorrhea." (Bloyer.)

Baptisia tinctoria is antiseptic, tonic, stimulant, alterative and emmenagogue. In very large doses it is cathartic and emetic. Indications.-Dusky coloration of the tongue and mucous membranes; full and purplish face, like one who has been long exposed to severe cold; in typhoid conditions with a continued moist, pasty coating on a tongue of natural redness; slick tongue, looking much like raw beef; stools looking like "prune juice or meat washings"; dark, tar-like, fetid discharges, mixed with decomposed blood; livid or blanched mucous membranes; putrid secretions.

Dose.-Fluid extract, 1/4 to 30 drops; specific medicine, 1/4 to 10 drops. Usual Prescription. A Baptisia, gtt. x to xx; water, 3iv.

M. Sig. Dose one teaspoonful every hour.

Barii Chloridum-Chloride of Barium.

The chloride of barium is a very efficient remedy in all cases in which there is an irregular circulation and an abnormal distribution of blood. In the vasomotor paralysis which sometimes occurs in infectious diseases it is a useful agent. Its action promptly reduces the heart's action and causes a greater quantity of blood to be circulated. The chloride of barium acts as a tonic, stimulates the reflexes, and assists the heart in bearing its burden. It increases the blood-pressure and at the same time reduces the frequency of the pulse. Its effects are apparent in from two to three hours' time, showing that the salt is rapidly absorbed.

Indications for the chloride of barium are frequently seen in pneumonia, typhoid fever, and other abnormal conditions. The barium salts are powerful poisons, and great caution should be exercised in their employment.

Indications.-Scrofulous indurations of the cervical glands and tonsils; hypertrophy of connective tissue of glands; loco-motor ataxia; sensitiveness to cold; scanty menstruation; weakened
cardiac action; dirty, inelastic skin; enlarged lymphatics; feeble respiration.

Dose.- 1/10 to 1/2 of a grain. It may be administered in the 1/100 of a grain of the 3x trituration, or a teaspoonful of a 5 percent solution may be given every two to four hours.

Barosma Crenata-Buchu.

Buchu is a valuable remedy in subacute and chronic diseases of the genito-urinary tract, but it is not adapted to cases in which there is active inflammation. It has a specific soothing and stimulating influence upon the mucous membranes of the urinary organs, and is especially indicated in any case of lowered systemic tone in which there is an acid urine heavily loaded with mucus or muco-pus. In cases in which there is a constant desire to micturate, and the act gives little or no relief, its action is markedly corrective, and in retention or incontinence of urine, due to an impaired condition of the parts involved, buchu is a very efficient remedy. It also constitutes an excellent medicament in gastric debility, especially when complicated by wrongs of the urinary organs. In chronic catarrh of the bladder, it is a desirable remedial agent, and in subacute or chronic cystitis it exerts a corrective influence. In pyelitis, hematuria and gravel it may well constitute a part of the treatment. In simple and gonorrheal urethritis it is employed with advantage, and in gleet and some prostatic affections it is regarded as a remedy of considerable value. It is also of some value in chronic rheumatism which is complicated by wrongs of the urinary apparatus.

Buchu does not materially increase the flow of urine, but its tonic effect generally, and especially its influence upon the mucous membrane of the kidneys, makes it a medicament of some value in dropsy.

"Buchu is useful in diseases of the genito-urinary organs with excessive irritation and undue and altered secretions from the urethral glands. In catarrh of the bladder, especially such as results from gonorrhea, or irritant injections used in its treatment, this remedy is very valuable. It may be used with good results in atonic dyspepsia. The infusion is a good remedy in dysmenorrhea, amenorrhea and leucorrhea." (Locke.)

"Catarrh of the bladder is another affection in which I have used buchu with a very gratifying degree of success. Its peculiar alterative properties are here manifested. It allays the irritation of the mucous surfaces, lessens the amount of mucus voided, and apparently cleanses and heals the abrasions of the mucous surfaces.

"In enlargement of the prostate gland and thickening of the urethral canal its value as a resolvent can scarcely be estimated. A persevering use of the remedy is requisite in these cases.

Among the serious affections to which the urinary apparatus is liable, and in the treatment of which I have employed the preparations of the buchu with remarkable success, I may mention hematuria. The specific tonic property of the remedy is here manifested, and in fact I know of no better tonic remedy for the kidneys under any circumstances.

"In rheumatic affections, so frequently dependent upon a uric acid diathesis, I have long employed this remedy with the most satisfactory results. Even in acute rheumatism, after the inflammatory symptoms are measurably subdued, I seldom omit its exhibition.

"I have cured many cases of lumbago with this remedy, in connection with alterative doses of podophyllin. "In dropsy it is mainly useful in the asthenic forms, particularly when the kidneys, from want of tone, are tardy in the elimination of the absorbed fluid, or are loaded with uric aciddeposits."

(Grover Coe.)

Barosma crenata is diuretic, diaphoretic, alterative, tonic, stimulant and antispasmodic.

Indications.-A constant desire to urinate, with but little relief from micturition; catarrhal conditions of mucous membranes of the genito-urinary organs; uric acid diathesis; chronic affections attended with excessive secretions; gravelly conditions characterized by the deposit of a pinkish-colored sediment in the urine.

Dose.-Fluid extract: 10 to 60 drops; specific medicine, 15 to 30 drops. Usual Dose.- 10 to 15 drops in water every two or three hours.

Belladonna-Deadly Nightshade.

Belladonna is a powerful stimulant to the vasomotor centers and also to the capillary circulation. It constitutes an energetic medicament in all forms of congestion. In the treatment of diseases peculiar to children a place for this remedial agent is found almost daily.

I have never seen a case of scarlet fever which did not call for belladonna as a part of a rational
treatment. It favors the development of the eruption, lessens the effect of the poison on the nervous system, improves the condition of the kidneys, and aids in the expulsion of the poisonous matter from the blood. In small doses this drug acts as a prophylactic against scarlet fever. This fact I have demonstrated on numerous occasions. Its prophylactic indications may be obtained by administering the remedy in small doses every two or three hours. In this way the disease has usually been confined to the first cases, but when not so limited the exceptional cases have always been of a very mild form.

The varied therapeutic powers of belladonna are equaled by but few other drugs. It is an excellent remedial agent in erysipelas when the skin is deep red, and also when accompanied by a burning sensation, and the surface is free from vesicles. In spasmodic dysmenorrhea and in spasmodic constriction of the bowels it acts in a curative direction, and in spasmodic cough and asthma it is employed with gratifying results. In the latter stages of whooping-cough it is also a favorite remedy. It lessens the severity of the paroxysms and lengthens the intervals between the attacks of coughing. Infantile convulsions of an epileptic form character also come within the curative range of belladonna, and in the treatment of chorea much benefit has been derived from its exhibition. In spasmodic conditions which come on suddenly, with intervals of profound sleep and deathly pallor and cool perspiration, and preceded in the early stages by extreme drowsiness and flashes of fever, belladonna is the urgently needed remedy.

In fact, it is a curative agent in nearly all functional diseases characterized by sudden exacerbations, with intervals of rest and stupor and flashes of fever, alternated with more or less perspiration, dry tongue and fauces, with rapid respiration. In nearly all febrile diseases indications for belladonna are frequently seen. It is a stimulant to the urinary tract, and in small doses relieves irritation. Its tendency is to increase the quantity of urine secreted. In incontinence of urine in young children, when the trouble results from poor pelvic circulation or from chronic irritability of the bladder, this drug can-be employed with the utmost confidence that it will aid much in removing the abnormal condition. In the annoying condition resulting from an excessive secretion of the salivary glands belladonna often gives prompt relief. It is also successfully employed in various forms of neuralgia.

Locally applied, belladonna relieves pain in abscesses, and when applied early often prevents suppuration. Largely diluted and applied hot it is of much value in orchitis, neuralgia and lumbago.

"The specific use of belladonna is as a stimulant to the capillary circulation, especially of the nerve centers-a remedy opposed to congestion. My attention was first drawn to it by an article from Brown-Sequard, giving the results of his experiments with the drug, stating that with the microscope he had seen marked contraction of the capillaries following its use. It at once suggested itself to me that if it would cause capillary contraction it would be the remedy for congestion; and I at once commenced experimenting with it in this direction.

"I well recall my first marked case, a boy about eight years old suffering from malignant rubella. The entire surface was swollen and dusky; the eyes dull; the pupils dilated; the face expressionless; breathing labored, and wholly unconscious for forty-eight hours. The administration of belladonna alone (in small doses) was sufficient to restore consciousness and a free circulation, with good appearance of the eruption, in twenty hours.

"The evidences in its favor rapidly accumulated, so that in eighteen months I used it with a feeling of almost certainty for this purpose.

"Whilst it exerts the same influence on all persons and at all ages, the true pathological condition being determined, it is especially valuable in treating diseases of children. In the young the immature nervous centers suffer more severely, and we find the opposite conditions, of irritation with determination of blood, and atony with congestion.

"The symptoms calling for the use of belladonna are usually very plain: The patient is dull and stupid, and the child drowsy, and sleeps with its eyes partly open; the countenance expression- less; the eyes are dull, and the pupils dilated or immobile; whilsts it continues respiration becomes affected and the blood imperfectly aerated.

"In these cases I prescribe belladonna: in the adult, in the proportion of gtt. v to x, to water 5iv; in the child, gtt. v to 3iv; in each a teaspoonful every hour. As these are mostly febrile cases, or at least have a feeble, frequent circulation as an element, I give aconite in the usual doses.

"Belladonna is also a specific in incontinence of urine. Not that it will cure every case, but those in which an enfeeblement of the pelvic circulation is the principal cause. Probably a lesion of the spinal cord has also much to do with it. Of course, it gives no relief where the incontinence arises from vesical irritation.

The dose in this case will be the same as above named, but only repeated four times a day.

"Belladonna is also a specific in diabetes insipidus, even a belladonna plaster across the loins
being sufficient in many cases for its arrest.

"Belladonna is undoubtedly a prophylactic against scarlatina, as I have thoroughly proven in my practice. Recollect, however, that it is only prophylactic in small doses; in doses sufficient to produce dilatation of the pupil it has no such influence.

"Belladonna has other special uses, but they may be briefly summed up: If in any case there is an enfeebled circulation, with stasis of blood, belladonna is the remedy. Of course, acting on some parts more directly than others, its influence will be more decided, but there is no case, with conditions as above, in which it will not be beneficial.

“I may say, in conclusion, that we want a good preparation of the recent herb; and then it must be used in small doses to obtain the influences named.” (Scudder)

“The direct specific indication for belladonna is impairment of the capillary circulation with congestion. With this condition always before us, not much difficulty will be experienced to find its exact place in therapeutics. In acute disorders, where there is inclination to dullness or stupor, or where these conditions really exist, pupils dilated, face pallid and expressionless, cerebral congestion, sluggish capillary circulation, extremities cool—all these call for belladonna, but in small doses. It stimulates capillary circulation by its decided influence upon the vaso-motor centers and nerve peripheries; is a direct and powerful stimulant to the sympathetic and the heart, exercising a powerful influence in enfeebled heart’s action and depression of the sympathetic influence.

“Whether child or adult, if during the course of disease our patient shows a decided disposition to sleep, there is dullness of intellect, dilated pupils, oppressed pulse, eyes partially open, all indicative of cerebral congestion, belladonna is indicated. There is a condition of chilliness, skin pallid, pulse full but oppressed, dull, sleepy headache, indicating capillary stasis, which belladonna overcomes. Those dull, heavy headaches, where pain is constant and where there is a feeling that if it were not for the pain, the patient could sleep, the remedy promptly relieves.

“In cerebral or spinal congestion, acute or chronic, where there is a dull, heavy aching and fullness in the head, drowsiness, eyes, dull, pupils dilated, or a condition of apparently threatening apoplexy, belladonna is a positive remedy. Sore throat, where the mucous membranes have a dark-red, dusky color, capillary engorgement plainly evidenced; at the onset of or threatened inflammatory conditions, pneumonitis for instance, to relieve the capillary engorgement and prevent local effects, the remedy is indicated. Persistent inclination to sleep, accompanied by vomiting, is relieved by it. So is whooping cough, where there is also the characteristic dullness, hebetude, and impairment of capillary circulation.

“In the exanthemata, especially the congestive forms, scarlatina in particular, eruptions are tardy, the skin appears congested and patient is drowsy, the remedy proves of true value. In meningeal inflammations, especially In the subacute forms, temperature several degrees above normal, skin cold and moist, eyes dull, pupils dilated, head drawn back, and is being rolled from side to side, eyes partly open during sleep, the remedy is directly indicated. Post-scarlatinal nephritis is a frequent condition relieved by belladonna; so are other cases of renal capillary engorgements.

"I believe belladonna to be particularly a child's remedy, and know that the dose must be small, if beneficial results are to be obtained. Active delirium during fevers, where there is cerebral congestion and surface circulation is markedly sluggish, dusky appearance of skin, will be subdued if the remedy is given in grain doses of the 3x. Deep aching of loins or back, with a sense of heavy fullness, will be relieved by one-third drop doses; so with the aching and chilliness often present during a 'cold' or preceding fever or gripe. In constipation, when the sphincter ani is abnormally contracted and there is local capillary congestion and lack of secretion, belladonna is indicated.

"In 'run-down' individuals, where there is indisposition to exertion, extremities are cold, nervous debility, when it is desirable to stimulate, this agent alone, or combined with any other indicated remedy, will produce salutary effects." (Niederkorn.)

"Except in degree and rapidity the toxic effects of belladonna and its chief alkaloids are practically identical. Small doses occasion dryness and constriction of the throat, with possibly disordered vision and such unpleasant head symptoms as vertigo and confusion of ideas. Moderate doses provoke a greater degree of dryness of mouth and throat, on account of which there ensues marked difficulty in swallowing. The pulse is slowed, the pupils dilated, accommodation defective, and vision confused. The skin is dry and a considerable rise of temperature may take place. When, however, a dose large enough to produce vaso-motor paresis is taken, the temperature falls. Large and toxic doses greatly augment the dryness and dysphagia and giddiness, the patient reels or staggers when he walks, there is great thirst, and sometimes drowsiness and nausea and vomiting occur. The saliva now becomes suppressed, breathing is rapid, and dilation of the pupil extreme.
Vision is either lost, or indistinct and double. The rate of the pulse may be doubled and the volume is full and hard. A marked scarlet efflorescence, resembling that of scarlatina, but lacking the punctations and subsequent desquamation of the latter, now overspreads the countenance and progresses upon the neck and body. The eyes are brilliant and staring, and the conjunctive may be congested. A peculiar active delirium accompanies and is of an illusional and loquacious character. The victim, though oblivious of his surroundings, sees visions, entertains spectres, has fancies and hallucinations, and other phantasmagoria, and gives way to laughter and gayety; again, the cerebral disturbance may be of a wild maniacal type, with furious delirium and fighting propensities. Loss of speech often occurs early, though repeated movements of the tongue and lips indicate the efforts to articulate. Purging, vomiting and unsuccessful attempts to micturate are frequent, though not constant, symptoms of belladonna poisoning.

Finally, with (rarely) or without convulsions, occurs a complete abolition of function, stupor sets in, the pulse becomes rapid and weak, the limbs cold, and paralysis closes the scene in death, which results chiefly from respiratory paralysis.

"Should recovery take place, the patient seldom recollects any of the circumstances of his illness.

"Extreme dryness of throat and mouth, scarlet efflorescence without puncta, widely dilated pupils, staring eyes, suppression of urine, and talkative or wild delirium should lead one to suspect belladonna poisoning. In medication, the first three symptoms should be a warning to cease the administration of belladonna or its alkaloids.

"When atropine is the poisonous agent the effects are much quicker than with belladonna, and abolition of muscular power may occur without either delirium or convulsions having occurred. A few belladonna berries have caused death, as has an enema containing 1-6 grain of atropine. By mouth 1-12 grain of atropine and hypodermically 1-30 grain have likewise proved fatal. Again, recovery has followed the injection of much larger doses. Death has occurred in five minutes after the injection of atropine.

It seldom takes place in less than two hours, and usually does not occur under fifteen to eighteen hours. Symptoms of poisoning are often delayed from one hour to five hours after taking the drug.

"Treatment of belladonna poisoning should be prompt. Emetics, stomach pump, lavage tube, and tickling the throat to produce emesis should be resorted to at once. As belladonna tends to wholly suppress the urine, catheterization should be resorted to early and frequent, to eliminate the poison and to prevent its reabsorption. As emetics, zinc sulphate, 20 grains, powdered ipecac, 10 grains, or mustard and salt (equal parts), two teaspoonfuls may be given in warm water, followed by copious draughts of lukewarm water, to facilitate emesis. Unless contraindicated by marked depression, 1/8 grain of apomorphine may be given. Purgatives, such as castor oil, are useful to free the intestinal tract of the poison. Sweet spirit of nitre facilitates its removal by way of the urinary organs.

"As partial chemical antidotes, animal charcoal, tannic acid and solution of iodine may serve a useful purpose.

"While by no means a settled fact that morphine and belladonna are in all respects antagonistic, it is still recognized that morphine judiciously employed is the best antidote to belladonna and atropine poisoning. The best rule to follow is to be guided by the pupillary response. Therefore small and repeated doses administered until the pupils contract and are maintained in contraction is the best method to pursue. From the fact that jaborandi and its alkaloid pilocarpine, and calabar bean and its alkaloid physostigmine are in some measure antagonistic to belladonna they have been recommended and employed as physiological antidotes in poisoning by atropine and belladonna. (Felter.)

Belladonna is a spinal, cardiac and respiratory stimulant, diuretic, anodyne, mydriatic, irritant narcotic poison, or a paralysant of the motor nerves, according to the quantity of the drug administered. In doses large enough to dilate the pupils it exerts an influence opposite to that obtained from the doses named in the prescription herein given, and, of course, does not meet the following specific indications, as they are based upon the small dose.

Indications.-Dusky redness of the surface from capillary congestion; patient dull and inclined to sleep; eyes dull and pupils dilated; deep aching of the loins and back, with a sense of fullness; dull, heavy headache; sleeping with the eyes but partially closed; night sweats of consumptives; diseases of the brain when there is a sense of fullness, dizziness, drowsiness and dull, heavy aching; incontinence of urine.

Dose.-Fluid extract, 1/4 to 1/2 drop; specific medicine, 1-20 to 1/2 drop. Usual Prescription.- A Belladonna, gtt. v to x; water, 3iv. M. Sig. Dose one teaspoonful every hour.