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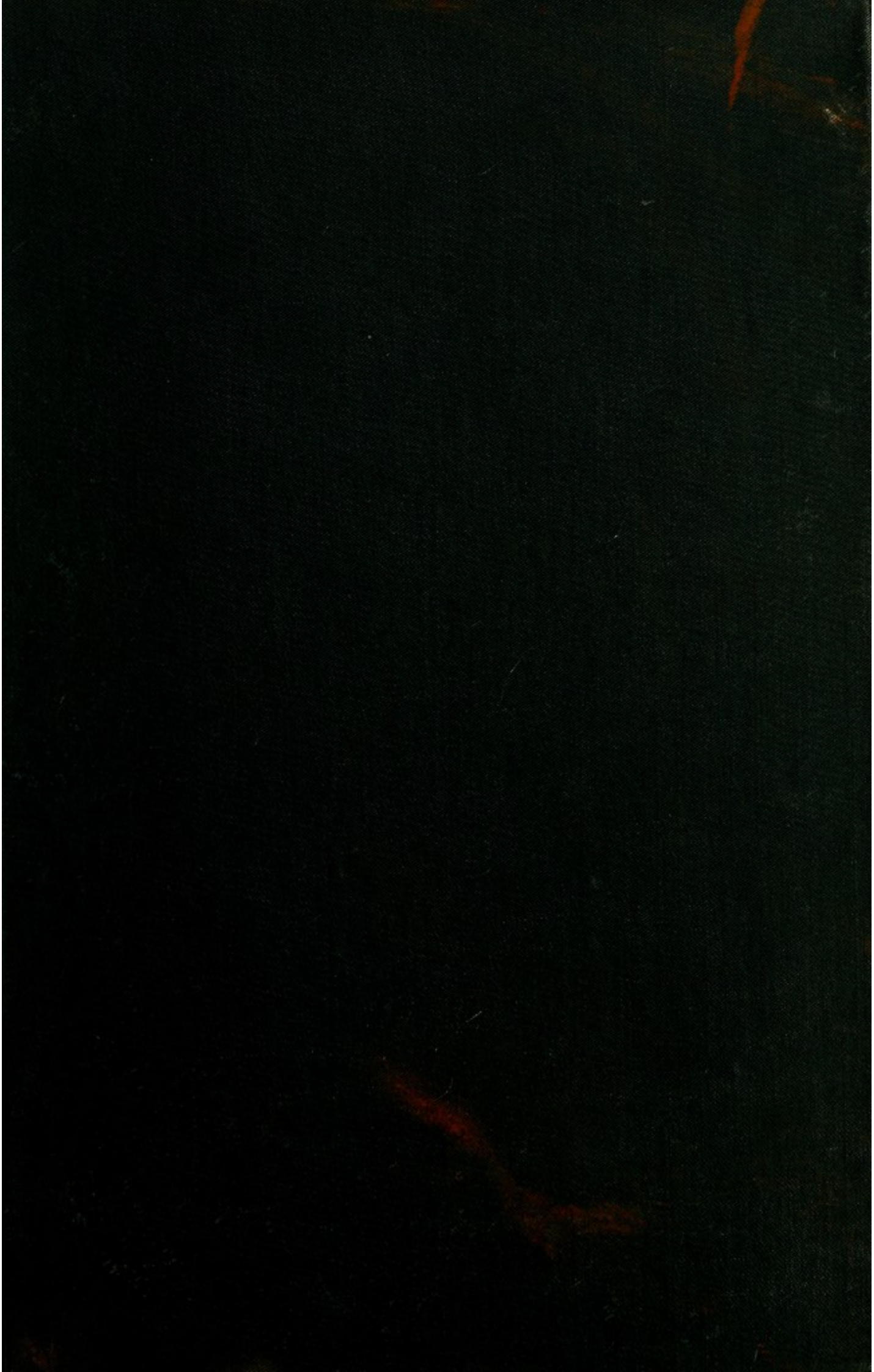

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THE

PRACTICE

OF

OSTEOPATHY

DESIGNED FOR THE USE OF PRACTITIONERS AND STUDENTS OF OSTEOPATHY

BY

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PREFACE.

This work on the practice of osteopathy has been written purely for the practitioner and student of osteopathy. Up to the present time there has been little attempt made along osteopathic lines in a literary way. The student has had nothing whatever to guide him in his studies but the notes he has taken from osteopathic lectures; and the practitioner no work to guide him or to refer to in his practice; yet it is with many misgivings, on account of the science of osteopathy being in crude published form, that I publish this work and give it to the osteopathic world. Still I feel a feeble attempt will be a stimulus to all apostles of the science, and especially so as the art of osteopathic practice is being well advanced. It will never be possible to write osteopathy completely and in detail as each case is an individual study. The best we can expect is to give the philosophy of the science and to state the principles in general terms. The science is practically unlimited; its breadth and depth are unmeasurable.

Osteopathic practice consists first of understanding the normal so that the abnormal conditions may be recognized when met; and second, when these abnormalities are found, of giving specific treatment and readjusting the parts. Practically, to the osteopath it makes but little difference what the disease is; it is his business to locate the derangement and correct it. This practical work is included in the practice of osteopathy and it constitutes the major part of this work; although I have given hydrotherapeutics, nursing, etc., not because I do not think readjustment of the tissues are sufficient to cure many diseases; but occasionally dis-

eases are due to errors in diet, sanitary surroundings, disobedience of hygienic rules, etc.; and besides the proper use of water, food, etc., are important aids oftentimes to alleviate suffering, being at the same time not injurious to the patient as drugs often are; especially in diseases that are far advanced the use of hydrotherapeutics, etc., is of aid.

I have given the old classification of diseases on account of its being universally employed and an attempt at a scientific classification might cause the loss of many valuable points, as our students are taught according to the old classification. I hope to see an attempt made in the near future to a more scientific nosology. It seems to me that the classification should be based upon the cause of the disturbance or according to the physiological disturbance. The diseases are taken up in a classified manner according to the best of our practices of medicine, as, definition, etiology, morbid anatomy, symptoms, etc. This is given in such a manner not because there is anything special to add in morbid anatomy or symptoms, but that it makes the work a complete practice of osteopathy and is inclusive of lectures given at the American School of Osteopathy. In a few instances I have given a theoretical treatment in diseases in which osteopathy has not had experience.

I am specially indebted to Osler, Anders, Tyson, Loomis, Raue, Goss, Stephens, and Hughes practices of medicine and to the writers in Allbutt's System of Medicine and the American Text Book on the Practice of Medicine. Also to American Text Books, Landois and Sterling's, Schaeffer's, Foster's, Flint's, and Yeo's Physiologies and to Ziegler's, Greene's and Stengel's Pathologies for many valuable ideas. It has been my full intention to give credit when possible, but not having access to first papers it has frequently been impossible to do so.

From my wife, Dr. Agnes Russell Darling, I have received much valuable aid in the preparation of the book.

To all my colleagues in the American School of Osteopathy and the Staff of The A. T. Still Infirmary, I am greatly indebted for many valuable suggestions.

I am under special obligations to Mr. Samuel D. Barnes, a senior student in the college, who has been a most able and untiring assistant in the correcting of the manuscript.

CARL PHILIP MCCONNELL.

INTRODUCTION.

Dr. Andrew Taylor Still, the discoverer of the science of osteopathy, has been working for nearly three decades in perfecting the science and art in all its branches. It is to him that we owe all that has been accomplished in the osteopathic work. He has ever been and still is working and delving into the mysteries of the human body to give to the world a philosophy of osteopathy. He is without doubt the foremost researcher in the osteopathic field. The work that he has accomplished, especially in the last ten years, has brought osteopathy into such form that it can be taught intelligently to the student. Naturally, there are many disconnected points and various regions of the field that have not been thoroughly investigated. It will be many years before the science will assume a definite form and place in the scientific world. By that I do not mean to be understood that the world of science will not recognize and give it a standing as a therapeutic science; but it will be many years before sharp lines can be drawn including or excluding certain points in the science and dividing this from other systems of medicine. The osteopathic field is such a wide one, covering as it does the entire area of the therapeutical field, that I dare say it will revolutionize the healing art of the future. It could not be otherwise, for Dr. Still and his followers are demonstrating day after day the efficacy of osteopathy as a remedial science. If there is any one point that should be convincing to the public it is the fact that Dr. Still has succeeded in bringing the reputation of osteopathy to what it now is by curing so many of the so-called incurable and discarded cases of other practitioners of medicine. If the osteopath is able to cure

a large per cent of the "incurable" diseases, what may not be accomplished when the time comes when an even opportunity will be given osteopathy to demonstrate its work beside other schools of medicine with the class of "curable" cases. Another point that appeals strongly and is particularly gratifying to the osteopathic practitioner, is that not a certain line of diseases only is treated more successfully by osteopathic work than other diseases, but that the entire field of medicine is covered by osteopathic therapeutics.

The aim of the introductory part of this work is to give the reader a few ideas along the line of osteopathy as a therapeutical science and to give comparison between drug therapeutics and osteopathic therapeutics. It is not the purpose of this article to dwell upon a historical sketch of osteopathy nor to enter into the history of medicine. The one can be readily obtained from reading some of the many excellent magazines on osteopathy and the other by a perusal of various literature on the history of medicine.

Osteopathy includes all that is reliable in the therapeutics of medicine, strange as this statement may seem to some, nevertheless, this is the true conception of what osteopathy really is. For many years osteopathic principles have been employed in the alleviation of human suffering, but it remained for Dr. Still to discover the underlying principles of osteopathy and to apply such principles scientifically in the prevention, alleviation and cure of diseases. Osteopathy is not exclusively a system of mechanical therapeutics, although manipulation enters very largely into the work. It is a system that includes all methods of healing that have been found trustworthy and scientific; whether it be mechanical correction of the tissues of the body, the giving of proper food, the use of antidotes, care and attention to hygienic rules, or nursing, and the various aids to prevent and relieve the ravages of disease. From the

first it should be clearly understood that osteopathy rests on a broad basis; that in a liberal sense it includes all that is good and in accordance with natural laws of the human body; and that it is not confined to narrow channels of thought or bigotry. Our students receive teaching in all branches of medicine save one—materia medica. When I use the term medicine I mean it in its broadest sense—not simply drugs, as many people erroneously think.

The refusal to teach materia medica in osteopathic colleges constitutes one of the cardinal points in osteopathic education. I may say here that the two differing points between the science of osteopathy and medical science are quite fundamental: (1) The cause of diseases, and (2) the cure of diseases. Naturally, the second is quite dependent upon the first. A word more in regard to the reputable colleges of osteopathy. They are not colleges where a smattering of anatomy and physiology is taught with a few Swedish movements and massage-like manipulations. They are colleges that teach minutely each and every branch taught in our best medical colleges except materia medica and drug therapeutics. These colleges of osteopathy court the closest investigation from all classes of people, in fact it is the desire of the colleges to have their work closely investigated. We have nothing of which we are ashamed and wish honest help in unfolding the details of our teachings. If we are wrong we are willing to stop, if not, we will win. Our results must speak stronger than words.

We believe and demonstrate daily that the causes of diseases are many times due to anatomical derangements. That the body being subject to many external influences, disorders of the tissues from an anatomical standpoint occur. Such belief is attacking the very foundation of medical science as taught by the thousands of medical colleges

throughout the world. To a layman it may seem presumptious for us to make the statement that we believe the causes of disease are often times different from those taught in the best medical colleges, so I am obliged to refer such a reader to any and all medical literature and he will at once see that such a statement is not a very outrageous one after all. Take any practice of medicine and it will be necessary to look over several pages before one can find a positive statement as to the exact cause of this or that disease. Not that we claim exactness or to know all in the osteopathic profession, but we do claim that we are a step in advance of other schools in knowing the causes of many diseases. Neither do we hesitate to give credit to the work of our medical brethren, for if it were not for them we would not be where we are to-day. It would be preposterous to state that all their work of many centuries has been in vain. No one claims that such is the case. The larger part of their work has been scientific without a doubt; but their work in the therapeutics of drugs has been largely for naught and I hope to prove it to the reader by writings from their own pen, before this article is finished. The ideas from ancient days still abide with them and from this fact and the demands of the public, on account of the public's habits and customs, drugs are given and daily experimentation is the rule. We are not differing from other schools of medicine to any extent more than that our work follows closely anatomical, physiological and chemical principles. We are differing from the etiological and the therapeutical point of view. We are willing to clasp hands with other practitioners except for this. Fortunately, or unfortunately, their ethics and dogmas are really inherent in them; they, as well as the public, will have to be educated into new lines of thought.

As has been stated, the real essence of differentiation

of osteopathy from other methods of medicine is in the cause of disease and dependent upon the cause is the cure of disease. We hold that if every tissue of the body is anatomically correct practically health must ensue. Thus the real cause of disease is displacements of the tissues not necessarily a bone, as the name osteopathy might imply, but any tissue of the body, chiefly bones, muscles, tendons and ligaments. That the various atmospherical changes, overwork, strains, slips, falls, blows, etc., are certain to a greater or less extent to affect these tissues and displace them partially or completely, or to strain or to contract them to such an extent that they interfere with the blood, lymph or nerve force or other fluids so as to cause an unequal or abnormal distribution of these fluids. Everyone is subject to the effects of atmospherical changes whether about their work in the day or resting peacefully in their bed at night. A draught of air, a damp day, whether one is warmly clad or not, has a greater or less effect upon the musculature of the body. When muscles are contracted they at once interfere with the cutaneous circulation and with the superficial nerve terminals; and, moreover, when severely contracted, produce traction upon the bones, especially the vertebrae and ribs and tend to draw them from their normal position; and these, when drawn from their normal position, directly interfere with vascular channels and nerve fibres, and thus furnishing the starting point of many diseases. The strains, falls, slips, etc., to which all are daily subjected have a similar action upon the tissues, but more directly upon the framework (bones) of the body and cause a strained position of the tissues, thus again interfering with the various fluids of the body. Granted that repeatedly contracted muscles, strained positions of bones, etc., amount to nothing, no ill effects being derived from them; but how often do they affect

us? Just as often as they are deranged to such an extent that nature is unable to cope with the disorder and set them right. Here is where *vis medicatrix naturae* is unable to meet the demand. Then the osteopath steps in and aids nature to set aright these disorders. He is unable to do more nor can he do less. He is simply an assistant to nature as a mechanical engineer of the human body. I quote from Dr. J. Martin Littlejohn from the Journal of Osteopathy, February, 1899, as regards the summary of the causes of diseases osteopathically: "Pathological conditions may be briefly summarized under three heads (1) misplacements of bone, cartilage, ligament, muscle, etc.; (2) Disturbances in the fluids of the organism including the blood and lymph and other secretions of the body. (3) Disorders and derangements of the nervous system, including its centers, ganglia, plexuses and fibres."

We must not lose sight, however, of many exciting and predisposing causes, as given in medical literature. Such causes are heredity, insanitary conditions, disobedience of hygienic rules, the various micro-organisms, and scores of causes that may lead to a disturbed function or disordered tissue of the body. The osteopath takes all of these into consideration, but oftentimes they are not the real cause. The osteopath differs from others chiefly in that he adds derangements of the tissues of the body to his etiology of diseases.

The all important questions now arise, how do these lesions affect the organs of the body, and how are these lesions removed. I wish to say here, that I owe an apology to all in the way I use the word "lesion." I have employed it in the most liberal manner, for I include all structural changes, displaced ribs or vertebrae, and contracted muscles as lesions, in fact any anatomical disorder that would cause an ill effect; I know of no better word to use.

How these anatomical disorders affect internal organs hardly comes within the province of this work, but I will state a few ideas along this line. This is one feature of osteopathic work that will require years of study to develop to a point of perfection. That these lesions do affect various organs and cause disease there is not the slightest doubt. The first essential point is removal of the lesion, whether it be in the bone, cartilage, ligament, muscle or other tissue. The second point is to regulate the general health of the patient exclusive of correcting disordered tissues by attention to modes of living, diet, etc. The removal of the lesion relieves the pressure from nerve fibres and vascular channels and one can readily see that a fibre or vessel may be impigned at a point quite remote from the locality affected. A nerve being irritated at a certain point by a rib or vertebra may cause a reflex irritation and thus produce symptoms and disease in another part of the body. The osteopath works chiefly, although not entirely, along the spinal column and ribs, correcting these lesions which produce effect upon the centers of the brain or cord; and correcting tissues that are influencing nerve fibres and vascular channels directly. Consequently the work is simply to replace tissues so that nature assumes the normal. The osteopath is able to stimulate or inhibit nerve force but very little; the work is to locate deranged tissues in detail and when these are corrected nature equalizes the forces which have been irritated and obstructed by these influences. I again quote from Dr. Littlejohn. He states that the work of the osteopath is: (1) "Scientific manipulations that aim to correct displacements in the bony or tissue structures of the body; (2) scientific manipulations that are designed to rectify the disturbances of the circulation of the body-fluids and to restore their normal condition, especially blood conditions and defects in the blood circu-

lation; (3) scientific manipulations that utilize the nervous system with its fibres, plexuses, ganglia and centers with the view of correcting disordered nervous conditions, toning the general system or its local parts, promoting trophic conditions of the nerves and muscles, and stimulating a normal correlation of the psychic with the physiological and vegetative functions of the human system."

"The entire body is for functional activity; hence there is nothing waste or superfluous and no room in the body for any abnormal condition. Hence the slightest deviation from the normal structure involves some interference with organic action and may give rise to untold mischief in the neural or muscular systems. Theoretically, osteopathy has for its ideal a body whose bone frame-work is perfectly fitted and delicately set, whose muscles are carefully attached in their origin and insertion, whose blood is freely circulated in every part of every organ and tissue and whose nerve force is the assimilating and life giving principle in the entire body. There is a sympathy of a physiological character between all the different parts of the body and this sympathy is based upon the nerve force. The laws of nerve energy furnish the principle upon which this uninterrupted sympathy may be preserved, and explain at the same time all possible deviations from the health standard. In harmony with these laws order must be restored to the system."

"Hence osteopathy regards the human body as a perfect mechanism, all the parts of which must be in harmonious relation to one another and so united as to form a perfect unit; otherwise the body is in a diseased condition. To apply the scientific principles of osteopathy it is necessary to have an exact knowledge of the structure, the functions and the relations of the different parts of this mechanism and of the mechanism as a whole from the standpoint of

chemistry, mechanics, anatomy, physiology, psychology, as well as the morbid anatomy and pathology of the body, its tissues and its organs when subject to disease. Only in this way are we able to discover the laws that govern the normal condition of the body and to find out the resources of nature available at the call of osteopathic treatment. Osteopathy recognizes that within the body are found those natural remedies, those essential human principles applicable on the basis of mechanics, those bioplasmic and metabolic processes which, when in normal equilibrium form the basis of health and furnish the means of correcting displacements, derangements and disordered conditions."

I think this states very clearly to the reader the object of osteopathic manipulation. It is readily seen that osteopathic manipulation is not routine general movements given to act on certain regions, but movements given according to the point involved. Osteopathic Therapeutics is not manipulation from the atlas to the coccyx to affect or cure diseases of a certain organ, but it is a treatment applied to the correction of a disordered mechanism involving nerves and vessels. For a most excellent and extensive article on the theories of influence upon organs by osteopathic work and manipulation, I refer the reader to Dr. Charles Hazzard's work on the Principles of Osteopathy.

The mode of treatment is a scientific manipulation by applying the mechanical principles which are indicated in each separate case. The osteopath applies the manipulation to relieve derangements of the anatomical so that the physiological potentiates. Then coupled with these manipulations is the use of water, dieting, nursing, etc., making with all, the practice of osteopathy a complete system of medicine and entirely in accordance with the laws of nature. Features to remember in connection with osteopathic

therapeutics are that correcting of the lesions stands paramount; that the osteopath does not hesitate to apply methods that are reliable outside of manipulation; that he does not believe in the use of drugs in a remedial sense because they are injurious to the patient and unscientific. For the various manipulations see article on Osteopathic Regional Treatment.

The point has been made that drug thereapeutics is not scientific and that osteopathic therapeutics is scientific. I quote from Allbutt's system of medicines: "We give drugs for two purposes: (1) To restore health directly by removing the sum of the conditions which constitute disease. Here we act empirically with no definite knowledge—often indeed with little idea of the action of our drugs, but on the ground that in our hands or in those of others they have restored health in like cases.

"(2) To influence one or more of the several tissues and organs which are in an abnormal state so as to restore them to or towards the normal; with the hope that if we succeed in our purpose recovery will take place. The purpose we effect by means of the influence which the chemical properties or drugs exert on the structure and function of the several tissues and organs. Minute information therefore, of the nature of drugs and their action is essential for their proper employment."

There is certainly nothing exact or scientific in the principles of drug therapeutics according to these statements. In the first place the admission is made that there is nothing definitely known in regard to the action of drugs; and in the second place, that drugs are many times given with only the hope of simply influencing the diseased tissues and organs. I think it unnecessary to dwell upon this statement for it is very self-evident that the giving of drugs is unscientific and empirical. If it has taken nearly twenty-

five centuries to come to such a conclusion and from the best minds of the world, does it seem reasonable that anything scientific in drug therapeutics will ever be developed?

The osteopath does not apply his remedy to affect the diseased tissues or organs directly unless the cause is discoverable in that organ, but first seeks the reason why and how such a tissue or organ is abnormal, and then removes the cause. He uses the symptoms and morbid conditions presented as clues only, for they are simply effects from which to find the cause of the disease; and does not treat the symptoms and morbid states as primary causes. He of course knows that if he can find the real causes and correct them, secondary conditions and effects will be remedied. Consequently he examines carefully the nerve and vascular supply to the diseased region and removes the impingements and irritations found to the forces that govern the area diseased. This is where the principles of osteopathic therapeutics are applied scientifically. The various strains, falls, etc., which impair the tissues by derangements of the anatomy are carefully located and removed and a cure results, providing a cure is possible. The action of micro-organisms, toxic substances, etc., are secondary to the disordered anatomy. If the tissues are correct anatomically health must ensue. I quote again from Dr. Littlejohn (*loc cit*) a passage which I think is very applicable here.

"The basic principle of osteopathy is that if the human organism is in perfect health, every body tissue and structure performs its part without interruption, the body structure representing the frame work upon which the other tissues of the body are built and to which they are attached. Hence osteopathy makes use of the bone frame work in establishing landmarks for physical examination and as a means of restoring misplaced parts of the body.

Hence the bones become the basis of operative manipulation, so that osteopathic manipulation is not to cure the bones, but represents the medium of the therapeutic operation, just as water is the medium through which heat and cold are applied therapeutically in hydropathy. Osteopathy recognizes the fundamental principle that for the body whether in health or sickness no extraneous medication is necessary, outside of the natural dieting suggested by experience as essential for the sustenance as well as the repair of existing tissues for the creation of new tissues in connection with the general disintegration and dissolution of the body bioplasm. Osteopathic Therapeutics incorporates within itself the fundamental principle that dietetics represents the essential basis of a healthy and vigorous system. Good food in sufficient quantity, not to excess, and sufficiently varied, together with muscular exercise and normal respiration represent the culinary and gymnastic theories of osteopathy.

"The success of osteopathy depends upon the fact that there is a complete establishment of harmonious action on the part of the nervous system in relation to the organs and tissues of the body, and the restoration if need be of perfect circulation in the organic fluids, perfect operation of all the vital forces and the removal of all impediments to the uninterrupted action of bones, muscles, joints. It is here that the osteopathic school of medicine breaks away from all the other schools. Osteopathy claims that it is the heir of all the medical knowledge accumulated through the ages and it takes the position that the use of drugs as remedial agents is a mistake in Therapeutics. It takes its stand upon the principle that a correct knowledge of and a scientific application of the anatomical, physiological and hygienic principles of human nature form the therapeutic

basis of the preservation of health and the prevention and cure of diseases.

"It seems opportune that osteopathy should step in to claim the field of Therapeutics, especially in view of the interminable conflicts in regard to the value and use of different drugs. Even physicians are losing faith in the cure-all capacity of the pharmacopeia preparations. Osteopathy goes beyond this skeptical stage, for it claims that the use of drugs is a disadvantage to the system and represents an unscientific method of attempting to cure diseases. It claims that human nature represents a perfect natural organism, having within itself the remedies of nature and therefore possessing the resources of recuperative, recreative and preventive action in connection with the diseases of the body. Disease is regarded simply as a disorder, a derangement or an abnormal growth, so that to restore health involves the elimination of some obstructing elements, the correction of some disordered condition or the removal of some unnecessary appendage. Whether the disorder is mental or physical, osteopathy claims that the application of the principles of natural law in their bearing on mind or body will remove the disorder. Every diseased condition is traced through symptoms, signs, or pathological conditions to its primary cause in connection with a nerve, muscle, blood vessel, bone, etc. As soon as the cause is located assistance is rendered to nature with the view of re-establishing its normal function. By thus harmonizing the forces of nature, adjusting structural relations, establishing normal functional activity in the nervous, circulatory, digestive, secretory and excretory systems, and in removing obstructions to the free play of nervous force and the free circulation of blood and lymph there is laid down a normal foundation for a healthy condition of mind and body.

"It is found that by the displacement or dislocation of a part of the body whether bone or muscle, there is produced a condition of pressure in connection with a nerve or nerves and a blood vessel, with the result that nutrition and nerve force are shut off from a part of the body. As is often the case in spinal troubles there is twisting or curvature of the vertebrae, involving direct pressure upon the nerve substance, cutting off the circulation and resulting in a more or less degenerated condition of the nerves and the muscles. It is a well known physiological principle that degeneration takes place in the case of cutting off a nerve from its trophic center, the degeneration taking place away from the center of trophic influence.

"That pressure upon such a nerve in the form of a tumor, dislocation, etc., can produce such a degenerated condition is a physiological maxim. To remove such a cause will certainly remove what produces the degeneration and *prima facie* tend to restore the normal condition. The influence of the pressure in connection with osteopathic diagnosis is based upon the physiological principle that when a nerve is mechanically stimulated with sufficient force to alter the nerve substance we find a pathological condition. The tenderness of certain parts of the body in connection with pain illustrates the physiological principle that the white sheath of the nerves is furnished with special nervi nervorum periphericorum which represents the sensory nerves of the pain sensation; in this way the different nerve paths are endowed with special sensibility, partly as a protection to the nerves from dangerous conditions and partly as a signal of such interference with the normal nerve functions."

SECTION I.

OSTEOPATHIC DIAGNOSIS.

The osteopathic examination of a patient includes largely the same measures and appliances that are used by other school practitioners besides the exactive and comprehensive physical examination that is peculiar to osteopathic work. It is in regard to the exclusive osteopathic diagnosis that I wish to speak. Other methods of diagnosis can be readily obtained from many excellent works on physical, medical and surgical diagnoses.

When a patient presents himself for an osteopathic examination and diagnosis the osteopathic physician should learn all that is possible to learn from the patient in regard to his history, methods of past treatment, morbid conditions, symptoms, etc. Oftentimes a fragmentary history of the case, a symptom or some little point in regard to the case may give one a direct or indirect clue to the cause of the disease. Hence, get as true an understanding of the case as possible at the beginning of the examination.

Now, in regard to the physical examination proper. If I have reasons to suspect from any conversation with the patient about his case that the trouble lies in the spinal column, as the causes of most diseases usually do, I have the patient assume a sitting posture upon the operating table or upon a stool or chair; then after the patient has loosened his clothing down to the spinal column I have him sit up squarely with shoulders thrown back and his hands placed upon his knees. This upright position of the patient keeps the spinal column in its normal position, otherwise a curvature would be apparent upon mere inspection of the spinal column which is not of a pathological nature and possibly mislead one. After the patient has assumed a correct sitting posture the osteopath should examine the spinal column from the rear of the patient by inspection. If there are pathological spinal curvatures of any extent inspection will readily reveal such and thus

possibly lead one to the cause of the patient's suffering. After having examined the condition of the spinal column thoroughly by inspection I then begin at the first dorsal and examine the spinal column down to the sacrum by placing my middle and ring fingers over the spinous processes and standing directly back of the patient draw the flat surfaces of these two fingers over the spinous processes from the upper dorsal to the sacrum in such a manner that the spines of the vertebrae pass tightly between the two fingers; thus leaving a red streak where the cutaneous vessels press upon the spines of the vertebrae. In this manner slight deviations of the vertebrae laterally can be told with the greatest accuracy by observing the red line. When a vertebra or a section of vertebrae are too posterior a heavy red streak is noticed and when a vertebra or vertebrae are anterior the streak is not so noticeable. Thus when suspicious points are noticed a special examination of the localized point can be given. This examination simply takes into consideration the contour and superficial condition of disordered portions of the spinal column. In a few cases such an examination will not be necessary for the symptoms and morbid states of the disease will be so clearly manifested that one's attention will be called directly to the cause. Still great care should be taken in the majority of cases, as the osteopathist finds causes of diseases remote from the seat of complaint. We must always bear in mind the significance of reflex stimuli and sympathetic radiation.

In making a delicate and exhaustive diagnosis of the spinal condition after the foregoing general examination has been made, it will be best to have the patient lie on the side upon the operating table. When the patient is in this position a more thorough examination can be made, as then the spinal muscles are not contracted unless abnor-

mally so, for when a person is in the upright position muscles are continually contracting first on one side and then on the other as one of their functions is to act as sort of guy ropes in keeping the spinal column erect. The patient lying on his side, the physician should then stand in front of him and reach over upon the back and make a thorough examination of the affected portions of the spinal column chiefly through the dorsal and lumbar regions.

Consideration should be given the contraction of the muscles along the back, chiefly the deeper layers of muscles. It may even be necessary to relax some of the muscles before a thorough examination of the vertebrae can be made. From a pathological point of view too much stress should not be put upon the contracted state of the muscles; although in a few instances the contracted muscles may be the primary cause of the patient's trouble; especially so when the affection is due to atmospherical changes. Usually the contraction of the muscles is secondary to the lesions presented in the bony frame work. For instance, a dislocated vertebra may be the cause of an irritation to the innervation of certain muscles along the spinal column and thus cause contracted muscles. Still we must not lose sight of the importance of the contracted muscles from a diagnostic point of view. They are oftentimes prominent signs that a lesion exists in the immediate region and are thus faithful guides in locating the cause of diseases.

In conjunction with the general examination of the spinal column special examinations of localized regions is usually necessary. I will take up the following examinations and regional diagnoses under the heading pertaining to the locality.

Neck, Head and Face.—To make a thorough diagnosis of the condition of the cervical vertebrae probably requires more skill and a more acute sense of touch than of any other region of the body. The irregularities and variations of the cervical vertebrae, the numerous muscles and the passage of many vessels through the neck are very liable to mislead one.

One may examine the cervical vertebrae by either having the patient lying down or in a sitting posture. I much prefer the former position, as then the muscles of the neck are inactive and besides it is much easier to relax the muscles if such should be necessary. Also one has better control of the field of examination.

It is undoubtedly best for the student when learning to examine the cervical vertebrae to first examine along the base of the occipital muscles (after the patient has assumed the dorsal position upon the operating table) for any contractions. For if any disorder exists in the upper five cervical vertebrae the condition will be manifested by contraction of muscular fibres along the base of the occipital bone, say from a line drawn from the middle of mastoid process to mastoid process. These muscles of the occiput are supplied by fibres from the posterior branches of the upper five pair of spinal nerves and if lesions exist to these upper nerves a contracted state of more or less extent of the occipital muscles will occur, no matter how slight the lesion. Thus the examiner after locating contracted fibres under the occiput has a direct clue to lesions existing somewhere in the upper five cervical vertebrae. After locating these contracted fibres of the occipital region and then still keeping the finger upon the contracted muscular fibres and following these fibres downward until the contracted fibres are lost and seem to enter the spinal cord, one has then located the exact point of disorder that is causing the irrita-

tion to the muscular fibres involved and most probably the cause of the affection from which the patient is suffering, i. e., provided one has reason to suspect the trouble is in the cervical vertebrae. Simply follow the contracted muscular fibre downward until it seems to enter the spinal cord and there one will find a lesion.

After one has become expert in diagnosis this will not be necessary unless one has to make a very fine diagnosis or unless one is examining a very stout neck where it is hard to examine through the heavy muscles. With this method one has a firm, flat, broad surface to work on (the occipital bone) making it very easy to first locate contracted muscles and second to trace the course of contracted muscles and thus find the disorder. Otherwise one is apt to get confused by trying to examine the condition of the cervical vertebrae at the start. Later, when a student becomes more expert such a procedure will rarely be necessary only in cases that require special work in the examination.

When the point of disorder has been located the diagnosis as to whether the vertebra is anterior, posterior, lateral or a combination of these positions has to be determined. The abnormal position of the vertebra, tenderness at the point involved, and local contracted muscles are the three diagnostic points, although the temperature of the affected part as compared with the general cutaneous temperature and the state of the local vascular channels (blood and lympatics) will occasionally be of aid.

Owing to the irregularity of the spinous processes of the cervical vertebrae in regard to their length great care has to be taken in the examination. Probably there is no other region of the body that will tax the patience of the osteopathic student so much in his practical work as in making a diagnosis of any disorder in the cervical spine. It requires patient and persistent work of several months to become a

fair diagnostician of the cervical region and it will take at least two or three years constant experience to become expert in the examination.

One can depend that lateral deviations of the spinous processes are abnormal in most instances. Placing the finger upon the spinous processes of two consecutive vertebrae one can readily tell whether or not there is any lateral displacement; but as to whether a vertebra is anterior or posterior is impossible as the spinous processes vary greatly in length. When a vertebra is lateral, a slightly twisted condition will be felt by the finger when placed upon the two spinous processes.

To tell when a vertebra is anterior or posterior one should depend upon the symmetry of the transverse processes. Reaching anterior to the serno-cleido-mastoid muscle or better still push the cleido muscles forward and reach posterior to them upon the transverse processes a very fair examination can then be given the vertebrae. When the vertebrae are deranged especially anteriorly or posteriorly a slight elevation will be felt, possibly not any larger than a very small pea, either along the anterior or posterior aspects of the transverse processes, depending upon which way the vertebrae are deranged. Remember that accompanying this slight elevation will be extreme sensitiveness of the vertebra at the point deranged. In cases where the vertebra is lateral a slight eminence will be noted along the outside of the process. Many disordered vertebrae are not entirely deranged in one direction but are oftentimes slightly rotated, so we may find them dislocated anterio-laterally or in various combinations. Then again we must realize that in the majority of cases lesions exist between vertebral articulations and that the vertebra itself is not thrown off from its articular points above and below. Again several consecutive vertebrae may be deranged in

like manner or direction; this condition is chiefly found in pathological curves of the spinal column. Probably the most common general lesion is a strained condition of several consecutive vertebrae, each one being quite intact but all of them as a whole somewhat strained or twisted. Thus there are many pathological states to take into consideration, although it is not surprising to the osteopath when he realizes that nearly all of our pains and aches are due to some anatomical derangement.

Sub-dislocations of the atlas are probably the most common lesions presented to the osteopathist. In fact there are very few people who have an intact atlas. Owing to the articulation of the atlas and occipital bone being an anatomical weak point and the neck muscles being exposed constantly to atmospherical changes, besides the articulation between the head and neck receives the brunt of many jars, falls and strains, it is no wonder the atlas is especially susceptible to derangements. On account of the intimate relation of the atlas to the superior cervial ganglion of the sympathetic and to the vertebral blood vessels it is certainly very necessary that the atlas should be well taken care of. No other tissue maintains such a significant position in relation to the blood and nerve supply to and from the brain. To be able to diagnose correctly the position of an atlas and then to be able to correct it will undoubtedly be one of the most essential achievements of the practitioner of medicine in the future.

The most common disorders of the atlas are anterior and lateral displacements. Next in order come "rotary" lesions of the atlas, i. e., where the atlas has been deranged diagonally or simply twisted. It may also be luxated anteriorly and laterally or posteriorly and laterally, etc. A posterior derangement of the atlas is comparatively a rare disorder, although owing to the many lesions that are found in at-

lases one has during the course of a year's practice many to correct. The atlas may occasionally be slightly tipped laterally, anteriorly or posteriorly and in a few cases it may be somewhat impacted against the occipital bone. Many times when the atlas is deranged the axis is also deranged on account of the close relation between the atlas and axis by the odontoid process of the axis.

To examine the atlas the patient may be either in the sitting or dorsal posture; it matters but little which position is taken. Possibly the dorsal position is better, as then the neck muscles are more relaxed and if necessary an examination of the cervical spine, below the atlas, can be easily made.

By placing the middle finger of either hand on the transverse processes of the atlas when the patient is in the sitting posture or the thumbs on the transverse processes when the patient is in the dorsal posture and comparing the two sides, undue prominence of one side or the other can be easily noted. Remember the transverse processes of the atlas are slightly above and posterior to the angle of the inferior maxillary. Always, in examining one side of the patient, compare it with the other; it may save considerable embarrassment. One side may seem abnormal when by comparing it with the other side, both sides may be found the same and still be normal. With the fingers still on the transverse processes note the distance between the process and angle of the jaw, besides take into consideration the tenderness of the locality. There should be room enough (approximately) to just comfortably wedge the end of a medium sized middle finger between the transverse process of the atlas and the angle of the inferior maxillary when both are normal. Thus with the fingers on the transverse processes an expert will be able to readily determine whether or not an atlas is lateral or anterior. If an atlas is posterior

the distance between the angles of the jaw and the transverse process will be increased, besides the atlas will be quite prominent posteriorly. In conjunction with the abnormality of the tissues (prominence or depression of the bone and state of the muscles) the sensitiveness of the locality is extremely significant.

Outside of displacements of the atlas a lesion between the axis and third cervical is most common; following next in frequency are lesions of the skull and atlas. By that I mean where all the cervical vertebrae are intact as far as their individual relation is concerned, but the skull is forward, backward or laterally upon the spinal column. This condition occurs quite frequently. To determine its condition the same methods are employed as in diagnosing a deranged atlas; for if the dislocations exist between the atlas and skull the same diagnostic points are presented as far as the skull is concerned as when the atlas or atlas and axis are dislocated from the occipital bone or from the axis or third cervical. Following the preceding examinations an additional examination will have to be made to see whether or not the atlas is intact with the vertebrae below. If the atlas is found to be intact with the vertebrae below and lesions are presented between the atlas and the skull then the disorder must be between the atlas and skull and nowhere else. I had a case within the last year where the skull was so far posterior upon the spinal column that the angles of the jaw struck against the transverse processes of the atlas when the jaw was opened widely.

Derangement of the muscles of the anterior and lateral regions of the neck are common. Especially are contractions of the muscles on either side of the larynx liable to occur. In examining the cervical region do not pay too much attention to the superficial muscles but examine carefully the deeper muscles. It is from these that impingements

of nerves and constrictions of vessels are likely to take place in the contracted fibres. In examining for contracted muscles do not gouge into the muscles nor grasp the muscle firmly, but bear down lightly (inhibitory) upon the muscles and then gradually exert firmer pressure. By carefully and firmly exerting pressure over muscular areas the deep muscles can then be felt beneath the superficial ones. Otherwise when the muscles are manipulated severely the superficial ones will contract to such an extent that the deeper ones cannot be felt. The muscles contracting on either side of the larynx tend to draw the larynx downward and thus there may arise a source of irritation. The various muscles contracting in the anterio-lateral region of the neck are very often the source of chronic irritations of the pharynx or throat. The omo-hyoid muscle may become contracted and cause slight traction on the hyoid bone and thus results an irritating cough. To examine the muscles of the neck thoroughly it is best to have the patient flat upon the back for then all the normal muscles are relaxed.

Lesions quite frequently occur in the temporo-inferior maxillary articulation. The lesion may be either unilateral or bi-lateral, more commonly the former. The disorder usually consists of a relaxation of the muscles and ligaments about the articulation which allows a slight but perceptible dropping of the inferior maxillary on the side involved. Lesions of this articulation particularly impinge upon fibers of the fifth cranial nerve. The points of diagnosis are clicking and tenderness at the articulation. These two points are the symptoms of which the patient complains; those noticed by the osteopath are a slight deviation of the jaw to one side or the other when the jaw is opened and a flinching of the patient due to tenderness when pressure is exerted over the articulation of the jaw. When the physician places his fingers around the jaw anterior to the angles

and the thumbs over the bridge of the nose and having the patient open the mouth and at the same time exerting pressure with the fingers and thumbs a sharp click may be elicited by the return of the jaw into its articulation.

In disease of the scalp the condition of the muscles of the scalp should be taken into consideration. The muscles are usually found contracted. The contraction of the muscles is generally due, as well as the disease of the scalp, to derangement existing in the upper five pairs of the posterior cervical spinal nerves.

The Ribs.—Under the osteopathic diagnosis of the ribs I will include the examination of the clavicle and sternum. To be able to diagnose intelligently the position of the ribs in detail is very necessary to the osteopathic physician. Many of the diseases of the heart and lungs besides a large number of the diseases of the digestive tract may be traced to a deranged rib; also, occasionally diseases of different regions of the cranium may be due to dislocated ribs. In making a thorough examination of the ribs each rib should be carefully noted as to its exact position. The ribs may be examined when the patient is sitting up; but it is better to have the patient flat upon the back if the floating ribs are to be carefully examined because the muscular tissues of the side if contracted will interfere with the diagnosis especially if the patient is stout.

An expert osteopathic diagnostician will be able to detect at once by a single passage of the hands down over the ribs if there are any disorders of them. In passing the flat of the hand, especially the flat part of the fingers, over the ribs carefully observe if the intercostal spaces are too narrow or too wide and if any of the ribs are unduly prominent or depressed. If an intercostal space is too narrow it shows that the ribs on either side of the intercostal space are too close together. Then the question arises which one of the

ribs is crowding upon the intercostal space or whether both of the ribs are crowded together. Usually when the sternal end of the rib is displaced upward, the involved rib is prominent; and when displaced downward the rib is depressed. Thus it is commonly quite easy to diagnose which is the involved rib. Besides finding an abnormal position of the rib there will be more or less tenderness over the rib. Finding a rib prominent or depressed and tender is generally quite conclusive that the rib is displaced.

If a typical rib is placed upon a flat surface and one end of it is depressed the other end will be elevated and *vice versa.* This peculiarity holds true when ribs (typical) are dislocated in the chest. If the anterior end is elevated the posterior end is commonly depressed and *vice versa.* Care should be taken in examining the first rib and the false ribs, for in these ribs this peculiarity is not found.

On the whole quite a complete diagnosis can be made of the condition of the ribs by examining the anterior part of the thorax. Although it is always best to examine along the angles of the ribs if for nothing more than to confirm the diagnosis made at the sternal ends. Still it must be remembered that the preceding only holds good when the entire rib is dislocated. Many times simply one end of the rib is deranged and the other end is practically intact.

Besides careful examination of the sternal end of the rib attention should be paid to the condition of the costal cartilages.

The costal cartilages may become deranged at either the articulation with the rib or with the sternum. The same rule holds good when the costal cartilages are dislocated as when the ribs are dislocated, i. e., when the cartilages are prominent they are usually displaced upwards and when depressed the cartilage is displaced downward toward its neighbor.

One is apt to think that a rib is only dislocated at its vertebral end, although lesions of the vertebral end are generally of greater significance as far as the causes of diseases are concerned. Still the sternal end of the rib must not be overlooked. In examining the vertebral end of a rib attention should be paid the angles of the ribs, for at the angles a better opportunity for examination is given on account of the prominence. It will be necessary in many cases to find out whether or not the vertebral end of the rib is lying between the transverse processes instead of in front of them. In many severe lesions of the ribs the vertebral end of the rib is dislocated upward or downward from the transverse process of the vertebra and lies between the transverse processes of the vertebrae above or below its attachment. This certainly requires considerable skill in the diagnosis for oftentimes the point to be found is barely an eighth of an inch in diameter. It is usually best before making such a close examination to relax the tissues well over the field of examination.

The ribs as a whole may be too transverse or too oblique upon one side. This is chiefly found in pathological curves of the spine but still such conditions may exist when there are severely contracted muscles especially in some cases of paralysis. Thus the contour of the ribs must be taken into consideration by comparing one side with the other.

In examining the first rib an examination somewhat different from the other ribs should be given. It is best to have the patient assume a sitting posture; then placing the middle fingers of either hand upon the first rib near its center compare one with the other. Also note the difference of the spaces between the ribs and clavicles. Generally the first rib is dislocated upward, rarely downward. Besides finding an abnormal prominence or depression of the rib at its center considerable tenderness will be noticed. Examina-

tions of this region are an every day experience with the osteopath.

When diagnosing the position of the floating ribs it is best to have the patient lie flat upon the back with the thighs flexed upon the abdomen so that the tissues about the lower ribs may be entirely relaxed. Then by placing the flat of the fingers carefully over the ribs the outline and position of the ribs can be easily discerned. The floating ribs are oftentimes found deranged and are the source of a great deal of suffering through the iliac regions. These ribs may become dislocated from the vertebral ends and drop down obliquely toward the iliac crest, or else the free end may become locked beneath the rib above. Occasionally both ends of the rib drop down quite perceptibly and consequently is the cause of considerable suffering. In such instances the rib is depressed inward so that the normal contour of the lower thorax is lost.

An examination of the clavicle should be carefully made. Always compare the clavicle with its fellow. Examine thoroughly its articulation with the sternum as well as at the acromian prominence. Quite often the sternal end of the clavicle is dislocated posteriorly to the sternum. I do not mean completely dislocated but slightly, although it may become completely luxated. The acromian end may be dislocated upward or downward.

In examining the sternum special attention should be given the articulation of the manubrium and gladiolus. The upper section of the sternum may drop posteriorly to the part below thus causing a shortening of the upper anterior part of the thorax. In a few cases a distinct ridge will be seen or felt over the articulation of the manubrium and gladiolus. This is due to the crowding anteriorly of the articulation of the sternal parts. Occasionally the ensiform cartilage is turned inward causing a very tender point but

this rarely occurs. Also the articulation of the cartilages in the region of the 8th, 9th and 10th ribs may be found considerably deranged, causing local tenderness and even stomach trouble.

Dorsal and Lumbar Spinal Regions.—To make a careful examination the patient should be stretched out on one side upon an operating table, although the general examination may be sufficient. Then standing in front of the patient and reaching over him a most careful diagnosis can be made. Do not stand back of the patient as the flat of the fingers can not be used to advantage in feeling the different vertebrae. The various contracted muscles that may be found along the spinal column will be of valuable aid in locating derangements of the vertebrae and vertebral ends of the ribs. By using contracted muscles along the spinal column as a guide for locating lesions I do not refer to the large superficial muscles but to the small areas of contracted muscular fibres of the deep muscles. It is the deep muscles that become more or less contracted when lesions of the vertebrae and ribs exist. The superficial muscles are generally contracted by atmospherical changes and are not generally the result of disorders in the osseous system. The preceding points in regard to contracted muscles can not be too carefully observed for there is a tendency among many osteopathists to treat the contracted deep muscles as primary lesions in nearly every case. Remember that they are usually due to the motor nerve fibres of the muscles being irritated by the spinal lesion; occasionally the cause is a reflex stimulus.

The Abdomen.—Examining the abdomen anteriorly or directly is usually secondary to examining the spinal column for lesions to the nerves of the abdominal viscera. Still a great deal can be found as to the condition of the various viscera by careful palpitation and manipulation over each viscus.

In examining the liver and biliary tract care must be taken that any gouging or severe bruising of the organs does not take place. The osteopath employs the usual methods of inspection, palpation and percussion used by other practitioners although he will be more able to readily detect the extent of a congestion and enlargement of the liver by careful palpation.

Quite a thorough examination can be given the biliary tract from the gall-bladder to the duodenal orifice of the biliary duct. By a careful inhibitory pressure over the duct the outline of the tract can be easily discerned providing the patient is not too fleshy. When the tract is swollen considerable tenderness will be present. The patient will complain of a stabbing or piercing pain upon pressure and manipulation if the duct is swollen.

Usually the tenderness is greatest nearer the duodenal orifice. The duodenal orifice is about one and one-half inches diagonally downward to the right from the umbilicus. In cases of impacted gall-stones the osteopath as a rule has very little trouble in locating the stone.

By the use of the ordinary physical methods in examining the spleen the osteopathic physician is quite expert. He is certainly more adept in palpation and percussion than other diagnosticians.

In examining the stomach the usual methods of inspection, palpation, percussion, analysis of the contents of the stomach, etc., are employed.

Palpation and manipulation over the intestines are practiced a great deal by the osteopath in various intestinal diseases. By his educated sense of touch he is able to locate at once any impactions of fecal matter. Such impactions are generally found in the ilio-cecal and sigmoid regions. In the various acute obstructions from invagination, tumors, twists, knots, etc., the osteopathic physician is many

times able to readily locate the seat of disturbance. There is one point that I wish to specially emphasize and that is do not overlook prolapsed regions of the intestines; such occur quite frequently and are a source of considerable suffering, especially constipation. Simple manipulation will never do any good, neither will spinal treatment or injections, as a rule. A specific treatment must be given and that is after locating the exact point of prolapsus, to reach carefully beneath the fold and replace it.

In emaciated subjects the kidneys can be readily located and in a few instances when they are diseased one can feel the contracted tissues about them. Be very careful not to injure the capsule about the kidney. Do not punch or gouge them in the least; but locate the kidneys by a careful firm downward inhibitory manipulation.

The Pelvis.—To be able to diagnose accurately and intelligently the pelvic region probably requires nearly as much skill as in examining the cervical region. The pelvic bones are liable to many subdislocations, especially in the female. The pelvis as a whole may be tipped anteriorly or posteriorly upon the spinal column. It also may be twisted or rotated laterally upon the spinal column. The most common lesions are subluxations of an innominatum forward, backward, upward or downward; or various combinations of these displacements, such as a tipping forward and downward of an innominatum, or a tipping backward and upward of an innominatum; but these combinations do not always exist in the manner given. As a rule when the ilium is anterior the ischium posterior then the innominatum as a whole is downward; when the ilium is posterior the ischium anterior then the innominatum as a whole is upward. This is only a rule, there are exceptions to it; for in some few cases when the ilium is anterior the ischium posterior the innominatum may be higher, and when the ilium

is posterior and the ischium anterior the innominatum may be lower.

To be able to diagnose such derangements will usually require considerable skill and practice, still there are symptoms and signs that are quite characteristic of such disorders. In examining the pelvic bones I commonly have the patient flat upon the back at first. Be sure they are flat upon the back for a very slight variation may make considerable difference in the relation of the pelvic bones one to the other as far as the diagnostic points are concerned. Then I go to the feet of the patient and grasping the ankles firmly rotate laterally both legs first to one side and then to the other, as well as pulling and pushing both limbs slightly, and then bringing the heels together directly in the median line of the body I compare the length of the limbs at the heels. If there is any disorder whatever in one innominatum and the thigh muscles have been relaxed thoroughly by the preceding movements and the heels are brought together in the median line of the body a difference in the length of the limbs will readily be observed at the heels. For if the ilium is forward the ischium must be backward and as a rule the innominatum is thrown downward thus causing an apparent lengthening of the limb which will be noticed by comparing the heels; if the ilium is backward the ischium must be forward and as a rule the innominatum is then upward, causing an apparent shortening of the limb on the affected side. A very slight variation in the pelvis will make considerable difference in an apparent lengthening or shortening of the limbs. Such conditions are generally met with several times a day by osteopathic practitioners. The object of the lateral rotary movement and the pushing and pulling of the limbs is to make sure that all the thigh muscles are thoroughly relaxed for it is a very easy matter to contract the muscles in one thigh and

produce an apparent shortening of the limb. Also be very careful in comparing the length of the two limbs at the heels where they come together that they are exactly in the median line of the body for if they should be to one side or the other, however slightly, there would be an apparent lengthening of the outer limb as compared with the limb near the median line. While the patient remains flat upon the back it is a good plan to compare the anterior superior spines of the ilium. It may be readily noticed that one is higher or more depressed than the other, simply helping to confirm your diagnosis. It is a good plan also to have the patient sit up squarely upon the table and compare the crests of the ilia, thus one may be seen to be higher than the other.

There are three diagnostic points exclusive of all other signs that are quite conclusive when coupled with the preceding examination. If an innominatum is dislocated or subdislocated there will be tenderness over the symphisis pubes on the side affected, tenderness over the ilio-sacral articulation on the side affected, and tenderness along the crest of the ilium where the abdominal muscles are attached. When tenderness is found at these three points it is quite conclusive that the innominatum is deranged, for at the symphisis pubes and ilio-sacral articulation tenderness must exist if the innominatum is disturbed and by a change in the crest of the ilium the abdominal parietes will be affected. Possibly the patient may complain of pain exclusively in one side along the pelvis and limb and thus be a leading symptom telling which side is affected.

Additional diagnostic signs will be rigidity of muscles along the ilio-sacral articulation and abnormal prominence or depression of the ilium at its articulation with the sacrum, depending upon which way the innominatum has slipped. Considerable deviation of the pubic bones may be

noticed. The pubic bone on the side affected may be either thrown upward or downward.

The X-ray machine in the American School of Osteopathy has shown subluxations of the innominate bones in several instances. This is certainly quite conclusive in confirmation of the osteopathic ideas in regard to the pelvic bones becoming dislocated so many times.

Examination of the *sacrum* and *coccyx* is best made while the patient is lying on their side. The physician standing in front of the patient and reaching over on the sacrum or coccyx any deviation from the normal can be readily determined. Lesions oftentimes exist between the sacrum and the fifth lumbar. This is an anatomical weak point where many lesions may occur. Other lesions may occur between the sacrum and ilium as seen especially in disorders of the pelvic bones. Lesions between the sacrum and coccyx are quite common.

The coccyx may be dislocated anteriorly, posteriorly or laterally. It is commonly dislocated anteriorly. The point of dislocation is generally between the coccyx and sacrum.

Uterine, ovarian and rectal examinations are largely of the same nature as those given by other practitioners, although osteopaths find that oftentimes other practitioners are mistaken in regard to the etiology of many diseases to which these organs are subject. The articles on the various diseases of these regions will give the essential points of diagnosis.

Arms and Legs.—There is very little that is exclusively osteopathic in regard to the diagnosis of disorders of the arms and legs. One important feature that the osteopathists finds in examining the arms and legs is that many of the disorders supposed to originate in the affected member is found to be caused from vertebral or rib dislocations.

Always carefully examine the spine in the region of innervation to the arms and legs when they are diseased. The shoulder and hip joints, as well as all joints, are subject to partial dislocations. Many times when pain or other symptoms are presented in the arms or legs the trouble is at the shoulder or hip joint or in the spinal column. There are two regions that are very apt to be overlooked in the examinations of the arms and legs and they are the elbow joint and the fibula. The small bones of the ankles and wrist as well as of the feet and hands are subject to many dislocations which are easily discerned upon examination. Special emphasis should be given in regard to many supposed diseases of the knee joints which are really caused by lesion in the spine or at the hip joint.

SECTION II.

OSTEOPATHIC REGIONAL TREATMENT.

Under regional treatment I will give exclusive osteopathic treatment of the various regions of the body. It must not be forgotten that the osteopath includes many measures in his treatment of various diseases as, nursing, dieting, hydrotherapy, antidotes, antiseptics, etc., and does not depend upon manipulation alone, although correcting disordered anatomical structures are paramount in osteopathic treatment. In describing the treatment of the various regions of the body it will be necessary to give more or less general treatments as the innumerable details that arise in each and every case can only be applicable to the case in hand. Every case is a law unto itself and must be studied individually in order to be able to understand it perfectly. So much depends upon the ability of the osteopathic physician in the treating of a case that in order to meet the case intelligently he must have absolute command of the various anatomical details of the body, not only in his mind but upon his finger tips. The sense of touch has to be very acutely educated and it requires months of hard, persistent practical labor in order to develop the sense of touch sufficiently to treat a case intelligenty. To be a successful osteopathic physician requires more native ability than it does to be an equally successful practitioner of other schools of medicine. If the osteopath does not understand normal anatomical details sufficiently to be able to tell abnormal structure from normal structure by the sense of touch he can not hope to be continually successful in osteopathic practice. Naturally, he will be able to cure a few cases by "hit or miss" or by hiding behind "general osteopathic movements." What an osteopath should be able to do is to recognize minute anatomical disorders to such an extent that he knows precisely wherein the trouble lies. Then by knowing what the affection is seventy-five per cent of the hard work is accomplished; for by a knowledge of osteopathic

mechanics and osteopathic physiology the "movement" or manipulation can intelligently be given to readily correct the disorder. If a person fully understands the nature of the derangements there will never be any fear about reducing the derangements providing the affection is curable. The real work of osteopathy is in making a diagnosis; the treatment is comparatively easy. "Learn to diagnose intelligently" should be the motto of every osteopathic student.

The General Treatment.—A general treatment but accentuates the ignorance, in the majority of cases, of many so termed osteophatists. I am extremely sorry that it is a fact that there is a tendency among some osteopaths to give general treatments in every case that they treat. The only explanation of such a procedure that I possibly can think of is a lack of conception as to what osteopathy is on the part of such osteopaths. To give a general treatment in every case is not only actually detrimental to the patient but it is the height of folly on the physician's part for it gets him into a slovenly habit of osteopathic procedure from scientific and curative points of view; besides giving the outside world an impression that osteopathy is but little different from massage and Swedish movements instead of skillful mechanical engineering of the human body.

A general treatment should only be given under three conditions: (1) Constitutional diseases that are to be treated symptomatically. (2) Anaemic cases. (3) When one is ignorant of the real cause of the disease. Each one of these conditions are quite self explanatory to an osteopath why a general treatment should be given. I might add a fourth condition and that is to those individuals who think they are not getting value received unless they have been treated from head to foot. Such patients are usually ignorant of

the philosophy of osteopathy and it is the osteopath's duty to teach them differently.

The general treatment consists of stretching the spinal column from the atlas to the coccyx and relaxing all contracted muscles along both sides of the spinal column, besides giving special treatment to the cervical region, between the scapulae, the splanchnics and internal and external rotation of the legs. It is no wonder that fake osteopaths do cure a case occasionally. They are quite certain to correct some disorder by pulling and hauling a patient around in such a manner. Still on the other hand they are very likely to do injury to the patient. Those who claim that no injury can come from osteopathic treatment simply show their ignorance. One can easily injure a person by osteopathic treatment if they are not extremely careful. It does not stand to reason that the most delicately constructed mechanism should stand any amount of manipulation and misdirected force that may be given it.

Positions of the Patient and Physician in Treating.—The position of the patient when a treatment is given depends altogether upon the affection to be treated. I treat about fifty per cent of all cases lying on either side or the back upon an operating table and the other fifty per cent upon an operating stool. Many osteopaths treat nearly all their patients upon a table. I find that it is much better to change back and forth because to correct a certain disorder may be hard upon the table, but will be comparatively easy when the patient is on a stool and *vice versa*. Besides constantly changing back and forth rests a physician greatly.

Learn to treat patients in various positions, because it will be impossible to have all cases assume a certain position when being treated; and especially in treating acute cases one is obliged to suit his treatment to the patient and not the patient to the treatment. I also think there is a ten-

dency for one to get into slovenly habits of treating when patients are all placed practically in one position when being treated; and certainly one cannot treat all cases in one position to the same advantage. Also learn to treat as well with one hand as with the other. Many times one will be in such positions that equal use of either hand will be required. Carefully educate the sense of touch in either hand.

Another point should receive consideration and that is learn to shift the strength exerted in treating from one set of muscles to others. Like when one is standing for a long time he will continually shift his weight from one limb to the other. In the same manner in treating use the strength of the hands awhile, then the arms, then the muscles of the back, then the weight of the body, etc.; all in such a manner that there is a constant change by utilizing certain groups of muscles for the same work, as well as utilizing the weight of the body of both physician and patient to advantage. It rests a physician greatly and thus allows him to perform a maximum amount of work with a minimum amount of strength and labor.

It is an advantage to the physician to treat upon the nude skin, thus preventing the fingers from becoming sore. Gowns can be easily made that open down the back so that the patient does not have to disrobe.

How Often to Treat.—How often to treat a case depends entirely upon the nature of the disease from which the patient is suffering. Just as in giving drugs it is with osteopathic treatment the frequency of treatment is entirely dependent upon the seat of the disease and its severity. Acute cases require a thorough treatment at least once daily and many times in severe cases the treatment has to be repeated several times daily. In subacute and chronic cases as a rule treatment should not be given as often as in

acute cases. Possibly once a day but usually alternate days is better. In office practice cases are commonly treated two or three times weekly. Still it is better not to treat some cases oftener than once per week.

There is more danger in treating too often than in not treating often enough. The real work of an osteopath is to correct disordered anatomical structures; and when a certain derangement has been corrected the tissues should have rest and plenty of time to repair. When treatments are given often it simply keeps the tissues in an irritated state and nature does not have time to heal the diseased tissues. Always make it a point at each treatment to correct some definite lesion and when the work is accomplished let the parts alone until the tissues have recovered as much as possible from the effects of the previous treatment before another treatment is given. The reason why some cases do not get cured under osteopathic treatment is simply because the osteopath keeps the diseased tissues continually in an aggravated state by the constant treatment so that they do not have the least chance to heal; the physician is thus adding irritation to the disease.

It is only by experience that one can tell how often to treat. Each case is a special study; what would be quite sufficient for a certain individual with a given disease would not be at all suitable for a second individual with the same disease. As in drugs what is suitable for one person would not be adapted to another, because the make-up of each individual is entirely different from others; but here the parallelism diverges, for in drugs there is a foreign agent introduced into the system, while in osteopathic treatment the curative agent is entirely harmonious with the idiosyncrasies of each individual. It is for this reason that experience in medical practice is so essential.

Most cases should not be treated as a rule after a meal

unless the patient is suffering from some digestive disturbance; for in treating other regions of the body outside of the digestive tract causes more or less stimulation of the parts treated and thereby draws blood away from the organs of digestion. Cases of disordered brain circulation where the patient is unable to rest or sleep at night should be treated at about their retiring time so that the circulation of the body may be equalized, thus giving the patient undisturbed rest.

The Neck and Head.—In the treatment of the neck the patient may assume the sitting posture or lie flat upon the back. I generally prefer the latter as then one has complete control of the neck and head. Before correcting the various dislocations of the cervical vertebrae it is usually best to thoroughly relax all the muscles superficial and deep about the field of operation. In relaxing muscles two methods may be employed. The muscles may be firmly grasped and manipulated until relaxed or a firm pressure may be exerted upon the muscle and thus inhibit its nerve force until the muscle relaxes. The latter method is comparatively slow and is usually given in acute cases where the patients are so weak and exhausted that they cannot stand any severe manipulation.

In relaxing muscles by manipulation, grasp firmly the belly of the muscle and draw outward on the muscle several times until it relaxes. If the patient is sitting, place one hand upon the head of the patient or about the chin in such a manner that complete control of the head is maintained throughout the procedure; then with the fingers of the other hand upon the contracted muscular fibres a manipulating or kneading of the muscle can be given. It is best to flex the neck and head to the side where the contracted muscles are, so that a better hold of the muscle may be maintained; then by a series of flexions and extensions

with manipulations of the contracted muscles outward, results can be readily obtained. When the patient is lying on the back the physician may stand to one side of the patient's head and with one hand on the forehead of the patient and the other hand around the opposite side of the neck, a rotary motion of the head and neck, which is equal to flexion and extension in the sitting posture, may be given by the hand on the frontal region while the other hand relaxes the muscles; or the physician may stand at the head of the patient and with either hand on the side of the head and neck of the patient a series of rotary movements of the head and neck may be given with manipulation of first one side of the neck and then the other; the hands and fingers being placed in such a manner that when the fingers of one hand are relaxing the muscles on its side the other hand is executing the movements of the head and neck, each hand continually alternating in the work. This latter method requires some practice in order to do the work readily and successfully, for quite a variety of movements are required.

In the former method after one has worked on one side he is obliged to change to the other side and go through the same process. Movements may also be given to stretch the contracted muscles, thus overcoming the contraction and producing relaxation of the muscles.

After having relaxed the muscles over the field of operation, correcting the vertebrae will generally be easier to accomplish. In correcting an atlas it matters but little whether the patient is sitting up or lying down. A firm hold of the atlas can be gotten in either instance. In correcting the middle and lower cervical vertebrae it is best to place the patient upon the back.

In correcting dislocations two general rules should be followed: (1) exaggerate or increase the dislocation. This is to relax the tissues about the dislocated articulation and to

disengage the articular points that have become locked. (2) reduce the dislocation by retracing the path along which the parts were dislocated. One can readily see that a dislocated ball and socket joint could be reduced only by the dislocated bone retracing the path through which it left its socket as the capsular ligament would at once prevent its returning to the socket by any path other than that taken when dislocated. This applies to all dislocations to a greater or less extent.

After locating the exact position of the abnormal vertebrae the first rule is applied, i. e., exaggerating the lesion by flexing the head in the opposite direction to which the vertebrae is dislocated. Then with one or two fingers placed firmly upon the side of the vertebra in the direction dislocated so that when the proper time comes the vertebra may be pushed or slightly rotated back into its normal position; and with the other hand producing flexion of the neck so that the angle of flexion is exactly over the involved vertebra, slight traction is produced, so as to be sure that the articular points will be disengaged, with rotation and extension of the head to a normal or upright posture and at the same time pushing in on the disordered vertebra, are the movements to be executed in reducing a dislocated vertebra. It takes considerable practice to be able to correct a vertebra and to know when a vertebra is corrected. The amount of force applied varies greatly in different cases. Cases of slight subdislocation require but little force while in long standing cases many times the amount of force required is about all that one wishes to exert. Although remember that often it is a slight rotary movement or twist given that aids the most in executing rule second. No matter whether a vertebra is anterior, posterior, lateral or rotated the principles applied are the same in each case.

Be very careful when flexing, extending or rotating the neck that too much strain is not brought to bear upon the ligaments. Some osteopaths seem to take delight in rotating and flexing the neck to a great degree. It is a dangerous procedure and moreover does not accomplish anything in particular. Remember that osteopathic treatment is scientific and not a number of general movements of various regions of the body. Locate the lesions exactly and then a specific treatment can be given in every instance. To illustrate the treatment according to the preceding rules we will assume that a certain cervical vertebra is anterior, say the fourth cervical. First, hyper-extend the head in such a manner that the fulcrum comes exactly over the fourth vertebra, thus throwing the fourth vertebra still more anterior or in other words exaggerating the lesion or increasing the space anteriorly between the third and fifth cervicals so that when the head is flexed forward and pressure is exerted upon the anterior part of the vertebra (body or transverse process) the vertebra will have room enough to occupy its normal position. Second, when the head is hyper-extended place a finger anterior to the transverse process of the dislocated vertebra and with the other hand around the head, that is producing the hyper-extension, throw the head forward with slight traction and rotation of it and at the same time push posteriorly quite strongly upon the dislocated vertebra. The method is simple and scientific and any other treatment is not necessary. Follow out the same principles in all cases no matter in which way the vertebrae are deranged.

In cases where the lesion is between the skull and atlas have the patient sit on a stool and reach around the head with one hand under the chin and the back part of the head against your chest; then with the other hand around the transverse processes of three or four upper cervical verte-

brae pull the spinal column toward the median line while at the same time lifting up on the skull with the other hand and throwing the skull toward the median line. The object of lifting up on the skull is to relax and disengage the articulations between the occipital bone and atlas.

The steps to be followed in correcting the various lesions are (1) exaggerate the lesion. (2) Place the fingers of the hand that are not employed in exaggerating the lesion over the extended portion of the lesion. (3) Extend the region that is flexed when the lesion was exaggerated. (4) When the lesion is being extended produce traction and slight rotation of the region. (5) At the same time extension, traction and rotation is being produced push in upon the extended portion of the lesion.

In treating the pharynx, tonsils and larynx outside of correcting derangements of the vertebrae an anterior treatment to these organs is very effective. Examine the deep muscles beneath the angle of the jaw in case the pharynx and tonsils are involved; and when the larynx is involved examine the condition of the muscles on either side of the larynx. After locating deeply seated contracted muscles in the region of the angle of the inferior maxillary place the fingers over the contracted tissues and then by a downward inward sweeping motion toward the median line the muscles may be readily relaxed. When treating the larynx relax the tissues on either side by an upward, inward movement on either side. These treatments are very effectual when applied directly to the disordered tissues.

To treat slight lesions of the inferior maxillary articulation stand at the head of the patient when he is lying down and hook the fingers about the jaw just in front of the angles and with the thumbs over the bridge of the nose have the patient open the mouth while considerable force is exerted against his effort. This reduces any slight dislocation of

the inferior maxillary. When the jaw is completely dislocated place a piece of wood or hard substance between the molars and exert pressure upward and backward on the chin. If the dislocation is bilateral work on one side at a time.

The object of treatment to the face is to stimulate or inhibit points of the fifth nerve that come near the surface (see neuralgia of fifth nerve); this is the only osteopathic treatment that I know of that simulates massage. While the patient is lying flat upon the back carefully stimulate these various points especially the supraorbital and nasal points with a downward and outward movement.

In treating the scalp simply relax the muscles over the scalp thoroughly. This is a secondary treatment to correcting the innervation to the scalp at the upper four or five cervical vertebrae.

In cases of pharyngitis, tonsilitis, croup, hay fever, etc., a local treatment may be given through the mouth upon the soft and hard palate that is very effective. Simply introduce a finger into the mouth clear back upon the roof of the soft palate and with a downward and backward sweeping movement from the median line on either side toward the tonsils considerable relief can be given the patient. This tratment relaxes the tissues, relieves the congestion and gives a stimulating treatment to the local nerves. A treatment of the same nature may be given over the hard palate to effect the palatine nerves, especially in hay fever, when the itching of the palate, and sneezing are extreme. In cases of young children it is best to protect the finger by wrapping a piece of cloth around it.

An osteopath should never give a manipulation or movement unless he understands why; for if osteopathy is of any remedial use whatever it is a therapeutical science. Just as soon as one gives general imitating movement, from

that moment his work is not of a scientific osteopath but of a Swedish movement curist and masseur and a poor one at that. The osteopath's work is to locate the anatomical derangement and correct it as a mechanic would correct any disordered machinery. General treatment largely amounts to naught, although in some few instances it is of aid.

To give a detailed description of the treatment of all lesions that may be found in the cervical vertebrae would be impossible; only a general survey of the work can be given. Each case calls for special treatment; but the same general principles are applied in each case. If there is any one thing that should be eliminated from osteopathic treatment it is those mechanical routine movements of rotating, flexing, extending and various Swedish-movement-massage-like manipulations that certain osteopaths give in each and every case. It shows that he is an imitator and does not have a correct conception of osteopathic therapeutics. True, it is, that routine movements will have stimulating and other effects upon the system. Why does the system need such effects? Is it the lack of exercise of the patient? If it is then let the patient exercise himself. You do not want to lower yourself to be a mere "engine wiper." If it is not the lack of exercise and the system is in need of certain effects then seek the cause and apply a specific treatment. Do not hide behind generalities. We have to use generalities many times in explaining the principles of osteopathy because we have not advanced far enough theoretically but we do know how to practice the art scientifically.

The Ribs.—In correcting dislocated ribs many methods may be employed, but all are subject to the same principles as given under the treatment of the neck and head.

One of the best methods to correct typical ribs is to have the patient upon the side with the side of the affected ribs upward. Find out exactly the nature of the dislocation,

i. e., what is the relation of the dislocated rib to the other tissues. Note whether the rib is upward, downward, inward or forward, locate the dislocated rib exactly. Then place your fingers upon either end of the rib while standing back of the patient. Place your fingers in such a manner that when the proper time in the procedure arises all that will be necessary will be to push the ends of the rib into their articulations. For instance, if the rib is raised anteriorly and lowered posteriorly you will place the fingers on the sternal end above the affected rib and the fingers on the vertebral end below the rib so that when the rib has been released from its abnormal position it may be slipped into normal position. After having placed the fingers in the exact position necessary, have an assistant take the arm and draw it obliquely across the face, while at the same time the patient takes a forced inhalation. The object of drawing the arm across the face and the deep inhalation is to exaggerate the lesion—to draw the ribs out of their locked position—so that the fingers upon either end of the rib may push the rib into normal position. Drawing upon the arm raises all the upper ribs as well as the dislocated typical rib, principally by the use of the serratus magnus; also inhalation has an effect to throw the rib outward and upward and thus away from its articulation. Thus after the lesion has been increased sufficiently to relieve the rib from its abnormal condition, the arm is relaxed, the patient exhales, and the fingers upon the ends of the rib correct the dislocation. This treatment is used to the greatest advantage when there is a complete dislocation of a typical rib; and can be given while the patient is lying down or sitting up, although the former position is preferable.

A method that I use a great deal when the sternal end of the rib is dislocated is to have the patient sit upon a stool with his back toward me; then by placing the knee in the

back, while standing up, or easier still for the physician to sit upon an operating table back of the patient, over the vertebral end of the ribs so that the rib may be held rigidly posteriorly, I reach around with one hand over the dislocated end of the rib and place my fingers upon the rib toward the side dislocated so that when the rib is sufficiently released from its abnormal position it can be readily pushed into place; then with the other hand under the axilla of the arm on the affected side, pull up and back on the shoulder so that the rib may be pulled away from its sternal articular end and at the same time have the patient take a deep inhalation so as to aid in throwing the rib outward, upward and away from its sternal attachment; then when the end of the rib has been released sufficiently, relax the hold underneath the axilla, have the patient exhale and slip the rib into its normal position by the fingers over the end of the rib. I find this a most excellent treatment. It is easy to give and does the work admirably.

Practically, the same procedure may be gone through when the vertebral end is dislocated, by changing your position to the front of the patient, but there is some danger of the knee slipping off from the sternum during the operation and injuring the ribs. Several other treatments may be given to correct dislocations of the vertebral ends of the ribs. While the patient remains sitting the osteopath may stand in front of the patient and reach around either side of the patient upon the angles of the ribs; then with an outward and upward move of the fingers upon the angles of the ribs, the ribs are pulled away from their locked position and are allowed to slip into normal articulation. This treatment is only applicable when the ribs are dislocated downward but it is one of the best treatments for such cases, and I give it many times when the vertebral ends of the ribs are thus dislocated.

Another method oftentimes employed in correcting dislocations of the vertebral end of the ribs is to have the patient lie flat upon the side with the affected side upward; then by flexing the arm on the forearm and placing the elbow against the chest or abdomen reach over the patient upon the angle of the dislocated rib and pull it away from the vertebra; when it is pulled away from the spinal column sufficiently, push upward or downward on the angle of the ribs, as the case may demand. The elbow placed against you gives complete control of the patient and aids in throwing the rib upward or downward by your weight against the elbow.

A treatment somewhat like the preceding one which is given many times is to reach underneath the patient's upper arm when he is lying down upon his side and the arm is extended upward across the face; then by placing the fingers of the hand underneath the patient's arm over the angles of the affected rib or ribs and reinforce the hand by the fingers of the other hand an upward, outward and rotary movement can be given the ribs, which pulls them out of their abnormal position and allows them to return to their normal articulation.

An effectual treatment to spread and raise the upper ribs is to have the patient flat upon the back and with the fingers of one hand underneath the angles of the ribs and the other hand upon the elbow of the patient's arm on the same side; then throw the patient's arm across the chest transversely and bear down upon the elbow and at the same time spring upward and outward on the angles of the ribs with the other hand. By throwing the arm across the chest and bearing down upon the elbow a tremendous leverage can be obtained upon the upper ribs, especially those between the scapulae. This treatment is very efficacious in lung and heart diseases.

Another method of correcting ribs is to have the patient flat on their face upon an operating table with the arms hanging down on either side of the the table and a small pillow or folded blanket beneath the upper part of the chest; then standing beside the table, or better still, place one foot upon a low stool and the knee of the other limb upon the table in such a manner that you are directly over the patient's dorsal region, one is then in a position to have full control of the vertebral end of the ribs. If the ends of the ribs are displaced downward, placing the thumbs on either side over the angles of the ribs and pushing upward and outward on the angles, the ribs can be very readily crowded into position. If the ribs, especially between the scapulae, are dislocated in any direction, they may be quite readily corrected by placing the hand over the shoulder posteriorly and throw it outward and upward and away from the spinal column in such a manner that the ribs are pulled away from their abnormal position; then upon relaxing the hold upon the shoulder with the one hand, the fingers of the unemployed hand may push upward or downward, as the occasion requires, on the angles of the affected side so that the ribs may be slipped into place.

Many times one is obliged to treat the ribs of one side as a whole. In such instances the ribs are almost invariably thrown downward except in cases of scoliosis of the dorsal region. Several methods may be employed to raise the ribs. Probably the best method is to have the patient upon the side and with one hand around the angles of the ribs and the other hand around the wrist of the upper arm of the patient, an upward lifting movement is given both upon the angles of the ribs and upon the arm of the patient. The work upon the angles of the ribs is to raise the ribs directly; the work upon the arm is to raise the ribs indirectly, principally by the use of the serratus magnus.

Another effective treatment is to have the patient upon the back and with one hand over the anterior ends of the ribs and the other hand over the angles of the ribs an upward movement is given the ribs by springing the ends of the ribs toward each other and by strong inhalation on the part of the patient. This treatment is most effective where the false ribs are at fault and especially in cases of hemiplegia. While the patient is upon the back an assistant may take hold of the arm and draw it upward over the head of the patient, producing considerable additional upward tendency of the ribs and the physician giving the same treatment of the ends of the ribs as before; or the physician may take an arm in one hand and raise it above the head of the patient and with his other hand around the angles of the ribs, and the patient inhaling deeply, the ribs may be raised.

A treatment that I use a great deal in raising the ribs as a whole is to have the patient sit upon a stool and reaching around the patient from in front, place my fingers upon the angles of the ribs and raise them upward on both sides at the same time. One should begin at the upper ribs in all treatments where the ribs are to be raised, as a whole, and work downward. This treatment can also be given by standing behind the patient and reaching around upon the anterior ends of the ribs and lifting upward while the patient aids you by deep inhalation. Remember that many times the ribs are drawn downward by contraction of the muscles, due to atmospherical changes.

To correct the first and the floating ribs a different treatment has to be given than the foregoing.

An upward displacement is the most common lesion of the first rib. To correct such a dislocation, have the patient sit upon a stool and with one hand pull the head to the opposite side in order that the lesion may be exaggerated

by the drawing of the lateral muscles of the neck, principally the scaleni, upon the rib so that it may be disengaged from its abnormal position; then with the fingers of the other hand upon a point midway of the ends of the rib, exert a downward pressure at the moment the extended head is straightened. If the patient is unable to sit up, and it is not best to give the foregoing treatment, have the patient flat upon the back with one hand take hold of the arm on the affected side and pull down and out upon the shoulder so that the rib may be somewhat pulled away from its articulation and released from its position; then with the fingers of the other hand upon the center of the rib, or its highest point, press downward when the hold upon the arm is relaxed. Correction of an upper displacement of the first rib is an every day occurrence. A downward dislocation of the first rib is a rare occurrence. To reduce such a dislocation, place the thumb beneath the vertebral end of the rib and with the other hand lift up strongly on the shoulder from beneath the axilla and at the same time exert pressure upward with the thumb on the end of the rib.

The floating ribs may be dislocated obliquely downward or the free end of the rib may be caught underneath the end of the rib above. In either case, in order to correct the displacement, place the patient upon the back with the thigh on the affected side flexed upon the abdomen so that the tissues about the field of operation are relaxed; then bear down carefully but firmly over the free end of the rib with the fingers until one finger can be hooked underneath the end of the rib; then with the other hand over the vertebral end of the rib, have the patient take a deep breath, at the same time springing the ends of the rib toward each other, thus relaxing the rib from its locked position; then have the patient exhale quickly and at the same time spring

the rib into its normal position. It oftentimes requires repeated trials, especially in stout persons, and quite often the operation is extremely painful to the patient. It is quite necessary that one should understand this operation thoroughly, as it is one of the most essential treatments in osteopathic practice. The floating ribs are very liable to dislocations and may be the cause of many pains in the side, disturbances of the vessels as they pass through the diaphragm, and inflammation in the iliac region. A palliative treatment may be given the floating ribs by having the patient lie either flat on the back or on the side; then place the hand near the vertebral end of the ribs and raise upwards while the patient takes a deep breath.

Treatment of lesions between the manubrium and gladiolus are best given by placing the patient upon the operating table with face downward and the articulation of the manubrium and gladiolus just over the edge of the table. An assistant should hold the patient firmly upon the table while hyper-extension or flexion, as the case may require, with traction, is exerted upon the head, neck and shoulders, and manipulation of the articular points is given to reduce the dislocation. The same principles are employed here as in correcting lesions elsewhere.

Corrections of the cartilages along the sternum is very easily accomplished by having the patient sit upon a stool and standing behind the patient place a knee in the back, and reaching around with one hand over the cartilages and the other hand underneath the axilla, execute the same movement as given in correcting dislocations of the sternal ends of the ribs.

A treatment sometimes used to release a depressed condition of the cartilages of the false ribs is to stand behind the patient while he sits upon a stool and reach around him with fingers underneath the cartilages and raise them up-

ward as he inhales. By having the patient take a deep breath and then exhaling quickly while the fingers are over the cartilages a much better grasp of them can be obtained. This treatment should be very carefully given, as there is danger of tearing the cartilages loose from the ribs.

The Dorsal and Lumbar Spinal Region.—Here, as in other regions of the body, before an attempt is made to correct the vertebrae the muscles should be thoroughly relaxed. The easiest method to relax the muscles is to have the patient lie upon the side; and then by standing in front of the patient and reaching over the patient with the fingers upon the contracted muscles an upward and outward rotary manipulation is given them from either side; or the patient may sit upon a stool while the physician stands in front with the arms around the patient and the fingers over the contracted muscles manipulating them upward and outward. Another very easy method, is to stand behind the patient while he sits upon a stool and place a thumb over the contracted fibres, with the other hand underneath the axilla lifting the shoulder upward and backward so as to favor a relaxation of the muscles, while the thumb manipulates them.

In relaxing the muscles of the lumbar region have the patient on the side upon the table; then flex the thighs upon the abdomen with your weight against the knees so as to control all movements of the patient, reach over the patient with the fingers upon the contracted tissues and manipulate them outward and upward on either side until they are relaxed. A method I sometimes employ to relax the muscles of the dorsal, lumbar and sacral regions is to place the patient flat on their face upon the table; then by pushing up on the muscles from above downward with the flat of my hand they are easily relaxed. This treatment

should be especially given when the patient's muscles are contracted by atmospherical changes and from standing a long time in one position. When the muscles of the back are contracting they draw downward and many times draw the ribs with them, as well as tensing the tissues over the sacral foramina and obstructing or irritating the sacral nerves.

To correct vertebral lesions of the dorsal region the same rules should be followed as in treating lesions of the cervical vertebrae. Treatments may be given with equal ease whether the patient is lying on the side or sitting up.

To illustrate the treatment of the dorsal region when the patient is lying down, assume that there exists a lateral lesion between two vertebrae; if the lesion is below the seventh dorsal I usually use the legs as a lever, and if the lesion is above the seventh dorsal I use the head and neck as the lever. By having the patient lie upon the side toward which the lesion is pronounced, I either reach under the neck or around the limbs with one hand and with the other hand upon the lesion bend the head and neck or the thighs in such a manner that the angle of the flexion is directly over the break in the spinal column, this is to exaggerate the lesion; then by slightly lifting up on the neck or limbs and with a slight rotation of this lever the flexed parts should be extended, at the same time exerting pressure with the hand over the lesion in such a manner that the vertebrae are pushed forward toward their normal position.

Practically, the same treatment is given when a patient is sitting up, with the exception, of course, that the limbs cannot be used as levers. Lesions of the dorsal region or even the lumbar region can be corrected while the patient is sitting up. By this method considerable lifting is done away with. In fact, the weight of the patient can be used

to great advantage by substituting it for one's strength. No matter in what direction the lesion is, the physician simply reaches around the patient's shoulders firmly so that he just holds the weight of the patient from falling to one side or the other; thus with one hand manipulating the lesion the other arm is around the patient guiding the weight of the body in flexion, rotation and extension. It is not necessary to lift up on the patient, but just let the weight of the patient act as strength applied to the power arm. I always make it a point when working upon dislocated vertebrae in any region of the spinal column that just as soon as I have obtained a slight move in the lesion I am trying to correct I do not attempt to correct it any more for the time being. A slight movement toward the right direction may be all that is necessary to relieve the ill effects of the lesion. In fact it might be impossible to get the lesion anatomically correct as the shape of the vertebra may have conformed in a greater or less extent to its abnormal position.

When posterior or lateral pathological curves exist in the dorsal region, I usually treat the patient when lying on the side, with one hand over the spines of the vertebrae and the other hand pulling forward and upward on the arm of the patient to separate the vertebrae as much individually as possible. Another excellent method is to pass one of the arms underneath that of the patient while the patient has his arms thrown above the head; then with both hands upon the vertebrae, the fingers of one hand reinforcing those of the other, considerable strength can be exerted upon the vertebrae. The physician may also stand in front of the patient while he is sitting upon the stool and reach around with the hands upon the vertebrae and manipulate them.

To reduce vertebrae that are dislocated anteriorly in the

dorsal region, especially between the scapulae, is very often an extremely hard matter to do. The method I employ very satisfactorily is to stand behind the patient while they are sitting upon a stool and reach around either side of them upon the sternal ends of the ribs corresponding to the anterior vertebrae; then have the patient relax all of his muscles with the head flexed upon the chest and have him at the same time take a full inhalation while pressure is exrted posteriorly upon the sternal ends of the ribs. The object of this method is to push back upon the rigid ribs, the lungs being full, which are attached to the anterior surfaces of the transverse processes of the vertebrae and thus upon the anterior vertebrae pushing them posteriorly; all of the muscles of the body being quite passive and the head relaxed on the body, a separation of the vertebrae is accomplished favoring a crowding posteriorly of the dislocated vertebrae.

To correct vertebrae of the lumbar region is on the whole much easier than in the dorsal region. Here the legs can be used to great advantage as levers. By the same method of flexion, rotation and extension as employed in the dorsal region when the patient is lying on the side, the work can generally be readily accomplished.

The lumbar region is oftentimes involved by various lesions and an osteopath is obliged to do a great amount of work here. Very common lesions of the lumbar region are slight posterior or lateral curves; also lateral lesions between the twelfth dorsal and first lumbar and lateral and anterior lesions between the fifth lumbar and sacrum.

The Abdomen.—The abdomen is treated directly in many diseases of its organs. The patient should lie flat upon the back, the legs flexed upon the thighs and the thighs flexed upon the abdomen so that the abdominal muscles will be thoroughly relaxed; and then the various organs of the

abdomen can be manipulated with ease. Remember that in many diseases of the abdominal viscera the treatment of the splanchnics and vagi will be the primary treatment rather than direct abdominal treatments.

In treating the liver directly, the ribs over the liver should be raised and spread and the border of the liver manipulated directly as considerable curative effect can be obtained, especially when the liver is congested and enlarged. Manipulation of the bile ducts is very essential in all liver diseases, especially in various "bilious" attacks. The treatment relieves any congestion of the ducts and removes collections of mucous in the ducts due to the congestion, as well as freeing any obstructed bile. The manipulation should be a downward deep one, directly over the path of the ducts from about the cartilage of the ninth rib to the duodenal orifice of the biliary tract, which is about one and one-half inches diagonally downward and to the right of the umbilicus. Be very careful when first manipulating, and bear down lightly over the duct so that the structures superficial to it may be relaxed as the duct is quite deep below the surface of the abdomen. Usually the gall-bladder can be emptied by light pressure over the skin above the cartilages of the eighth, ninth and tenth ribs. The light manipulation probably acts as a stimulus to the dilators of the sphincters of the gall-bladder.

Manipulation of the stomach has some effect in strengthening its circular fibres and toning up the coats in general. In cases of gas formation, the gas in some instances may be forced through the cardiac or pyloric orifices by manipulating over the stomach.

Direct treatment over the spleen by raising the eighth, ninth, tenth and eleventh ribs of the left side is a very effectual treatment in congestion and enlargement of that organ.

In thin subjects the kidneys can be treated directly by pressing down carefully but deeply over the kidneys and lightly crowding them upward and outward. This treatment also has some effect in relieving contracted tissues about the renal vessels and kidneys.

Treatment to the intestines through the abdomen is a most necessary treatment many times. In case of the various obstructions to the intestines in constipation, etc., the direct treatment is essential. Treatment of the intestines is to correct any abnormal position that they may have assumed, to relieve constrictions of the gut caused by contracted tissues, to relieve impactions, to increase peristalsis and to tone up the intestinal coats in general. The treatment consists of a manipulation of the intestines, especially the right and left iliac fossae, as impactions and prolapses of the gut are more liable to occur at these points than in any other locality. In manipulating the intestines, try to manipulate for a definite purpose and do not give a general kneading treatment unless the wall of the abdomen and the coats of the intestines are weakened; in the latter case the spinal treatment is the primary one. In treating over the iliac region, draw upward and inward on the folds of the gut. It is claimed by some that nerves pass from the cutaneous surface of the abdomen directly to the intestines by way of the peritoneum; if such is the case, manipulation of the abdominal walls would have direct effect upon these nerve fibres. The abdomen may be treated when the patient is sitting up, but the treatment is not satisfactory.

The Pelvis.—The treatment of the pelvis is easy, but the hard work comes in when making a diagnosis of the position of the pelvic bones. The pelvis is especially apt to become deranged by jars and falls. Some of the most successful osteopathic results have been obtained in correcting the pelvic region.

To relax the muscles over the pelvis, the patient should be on the side or upon the face; then relax the muscles by manipulating them upward, chiefly those over the sacral foramina. The easiest method to correct the innominata is to have the patient lie upon their side; then by standing in front of the patient slip one hand between the thighs and grasp around the tuberosity of the ischium, and with the other hand upon the crest of the ilium, the innominatum can be thrown upward or downward and forward or backward with ease (wheel and axle principle). Simply pulling or pushing upon these two points in whatever direction necessary is all that is required. By having the patient flat upon the back practically the same treatment can be given, but not to so great an advantage. In cases where the ilium is posterior and the ischium is anterior, the physician may stand back of the patient, while they are lying upon their side, and place one knee against the sacrum and with one hand upon the ilium and with the other take hold of the ankle of the affected side (the involved side being uppermost in all cases where the patient is lying upon his side), pressure can be exerted upon the ilium and the limb can be pulled backward, thus correcting the derangement. This treatment should be avoided as much as possible, as there is considerable danger of pulling back too severely and injuring the patient; the lever is long and the amount of force exerted upon it cannot be judged precisely.

To correct a rotary lesion between the pelvis and fifth lumbar the patient should be placed upon the side and with the body held firmly the pelvis can be forced backward or forward as the occasion demands.

Treatment of the *coccyx*, *rectum* and *female generative organs* will be considered under special articles on those subjects.

The Extremity.—*The Arms.*—In treating the arms, care has to be taken that the affection is not due to spinal derangements; otherwise the arms are manipulated entirely according to the disease. Complete dislocations of the shoulder comes under the province of surgery. Many times the osteopath locates slight or incomplete dislocations of the shoulder. Partial dislocations of the shoulder are generally anterior.

In cases where pains exist in the shoulder or arm outside of locating the cause in the shoulder joint the affection may be due to fibres contracting over the coracoid process; or a dislocation of the second or third rib, and in some instances the clavicle is deranged. In a few instances muscular fibres may slip out of the bicipital groove. Dislocations of the bones of the arm are treated according to surgical methods. The pains and various troublesome symptoms that may be manifested in the fingers or the hands are oftentimes caused by slight dislocations of the elbow, shoulder, ribs or vertebrae.

The Legs.—The origin of many symptoms manifested in the legs, as in the arms, are due to spinal lesions corresponding to the region or innervation to the affected tissues. The derangements of the pelvic bones are a frequent source of symptoms that are referred to the legs and feet. The osteopathic physician finds that many times a slight dislocation of the hip occurs which is especially apt to affect the knee by way of the nerve fibres. The partial dislocation is apt to be an upward-posterior one; the head of the femur resting in the upper and posterior part of the acetabulum. Many diseases of the legs and feet are due to local displacements of the bone. The method of treatment is the same as given in surgical works.

A general treatment of the legs and thighs is oftentimes necessary; it consists of flexing the thighs quite firmly upon

the abdomen and executing thorough external and internal rotary movements of the thighs and legs. In a few cases both limbs are flexed strongly at the same time upon the abdomen. After giving these movements manipulation over the saphenous opening and beneath the popliteal space is performed. This general treatment tends to increase the circulation of the entire limb and to relax thoroughly all contracted fibres.

The preceding osteopathic regional treatment includes the majority of treatments given by osteopathic physicians. Although knowing well that many osteopaths use methods not given here, I have purposely left them out, as I think they are dangerous treatments and should be excluded from osteopathic therapeutics. The treatments given are the ones used in my practical work and will be found extensive enough for all purposes.

SECTION III.

INFECTIOUS DISEASES.

FEVER.

Fever is due to various causes, so that a definite statement cannot always be given as to the cause of fever in every disease. Each fever case, like all other disorders, is a law unto itself; different causes are found in different cases. Moreover, often theories, not absolute facts, can be given.

Fever may be present when a local disease assumes a constitutional character or when the constitutional character is manifested from the beginning of the disease. Fever may be a systemic disease or a symptom of disease. and is characterized by an increase of bodily temperature. Other symptoms are usually present, as an accelerated pulse, disturbances of distribution of the blood, increased katabolism, and disordered secretions.

Etiology.—In infectious diseases fever is chiefly caused by the action of various toxic or harmful agents, produced by the disease, upon the fluids of the body and upon the nervous system. Disturbances of the thermogenic centers of the brain or cord and the thermogenic nerves by harmful agents, or by lesions of the anatomical structures affecting these nerves may be a source of fever. Also disturbances of the vaso-motor centers (predominating center in the medulla and auxiliary centers along the cord) and nerves is the cause of fever in many instances. A disturbed or lessened function of the nerves controlling sweating is an important factor. The multiplication of micro-parisites in the body acting directly on the tissues or by producing toxic substances which affect the nervous system is a fruitful source of fever. A few cases may be caused by direct affection of the nervous system, as is shown by appearance of fever in epileptic attacks, or by the passage of a catheter into the bladder. In a large majority of all cases a demonstrable cause can be found upon a careful examination, whether the

fever be due to a necrosed mass of tissue, the introduction into the system of decomposed food, infectious diseases, a lesion of some anatomical structure affecting a thermogenic, vaso-motor or sweat center, a lesion to the innervation of the heart (vagi and cervical sympathetic) causing a rapid heart, or a lesion to the lymphatic system.

Treatment.—The treatment of fevers in a general way consists principally of thorough inhibition of the posterior spinal nerves of the upper cervical region in order that the predominating center of the vaso-motor system in the medulla may be affected, probably by the way of the superior cervical ganglion of the sympathetic. Thus the entire vascular system is equalized, for there is always a disturbance in the distribution of the blood in fever and if the center controlling the nerves that govern the lumen of the blood vessels can be brought under control there will result an equalization of the vascular system; if such occurs, health must ensue. Besides the vaso-motor nerves being affected by this treatment, the nerves controlling the lymphatics and the sweat glands will also be affected. The sweat glands as a rule are rendered active by affecting directly the innervation of the glands, also the glands are affected indirectly through the blood supply. This aids materially in lessening the temperature of the body. This same treatment and inhibitory treatment for a few minutes to the upper posterior cervical region would also affect the thermogenic centers and nerves of the brain reflexly in the same manner as the vaso-motor and sweat centers and nerves are affected, thus tending to equalize the mechanism of the thermogenic system. Besides this action on the vaso-motor, sweat, and the thermogenic nerves there is produced an increased exhalation of moisture from the lungs, on account of an increase of vascular area in the lungs through vaso-motor action. Also the large vascular

area in the abdomen under control of the splanchnic nerves becomes constricted. Thus there is brought about a lessening of temperature by evaporation, heat radiation, and perspiration; and an increased action of the general nervous system, a stronger cardiac force, an equalization of the vascular system, and a more perfect elimination of toxic properties by the skin, kidneys and lungs; consequently a reduction of the fever.

The foregoing treatment can be successful to a limited extent, only in such cases where the causes of the fever are involving the predominating centers controlling the heat production or dispersion and the vaso-motor system directly; for if the lesion that is causing the disorder should be affecting an auxiliary center along the spinal cord instead of the perdominating center, as is oftentimes the case, treatment of the predominating center would be useless as far as any permanent benefit is considered; although a temporary effect will be gained by lessening the fever at that point. Consequently, in many cases, the lesion lies within the jurisdiction of auxiliary centers which are situated at various points along the spinal cord. When such is the case, it would be utterly useless to give the cervical fever treatment in order to relieve the disorder. In such instances the lesion to the auxiliary center would have to be removed in order to cure the case. We cannot depend upon a set rule to reduce a fever. We have to determine the cause as in any other disease or symptom, and remove it.

In addition to the treatment in the cervical region and at various points along the spinal column, as are indicated upon an examination, attention should be given to the heart's action. The equilibrium between the accelerator and inhibitory nerves (cervical sympathetic and vagi) should be maintained. The interchange of gases in the lungs should be rendered as nearly normal as possible; this

is best accomplished by a raising and spreading of the ribs from the second to the seventh dorsals, particularly in the region of the fifth and sixth ribs. Also stimulation of the vagi will aid by increasing the motor power of the lungs. The kidneys and bowels should be kept active so as to favor a rapid elimination of various toxic properties; besides they have control over large vascular areas. Treatment over the ureters will prevent any clogging that might occur in them from a condensation of the urine. Also attention should be given the tissues at the fifth lumbar and over the iliac vessels to influence the circulation in the pelvis.

The food of the patient should be liquid, milk, soups, broths, etc., and most any quantity of water allowed if called for; given little at a time and at frequent intervals. The room should be well lighted, ventilated, clean and kept at an even temperature.

Two points must always be remembered in connection with fever:

First—That there are many causes of fever; and in order to reduce the fever the cause must be determined and removed, the same as in any disorder. A definite fever treatment cannot be given any more than a definite constipation treatment; the case must be seen in order to determine the cause.

Second—The reduction of fever is not necessary; the fever should be treated only as a symptom of disease when it exists as such. In fact, fever is beneficial, for it is one of nature's methods to relieve an overburdened system from harmful agents unless the temperature is excessive and continuous and is likely to cause more harm than the primary trouble.

Hydrotherapy is of immense value in relieving a fever. It is an agent that has been greatly used, and if applied intelligently cannot but be of aid. There is much igno-

rance in regard to the principles and practice of hydrotherapy, not only among all classes of people but among other well informed practitioners in medicine. The most important function of the skin is as a heat regulator. Knowing this fact, the osteopathist treats the vaso-motor nerves that control the cutaneous circulation and the nerves that control the excretion of the skin; the nerve supply being from the cerebro-spinal and sympathetic nerves. In many difficult and obstinate cases hydrotherapeutic measures should be used to aid the skin in regulating the temperature; as well as to enhance system functions for the same reasons as osteopathic manipulations are given. Maintaining an equilibrium in heat production and heat dispersion is necessary in order that the standard of the body temperature may be kept; and the amount of the arterial blood circulating within a tissue determines its temperature.

The principal effect of water as a thermic agent when applied externally is due to the influence of the action of the water upon the cutaneous circulation. Lesser effects would be the mere extraction of heat from the body by evaporation and the equalization of temperatures of two bodies coming into contact. As the body is endowed with compensatory powers, this latter means would apply only to a limited extent. The temperature of the water used is important, as the colder the bath the less effective would its power be in reducing internal temperature. When a cold bath is used there is a driving of the blood away from the surface on account of the contraction of the peripheral vessels; consequently increasing the cutaneous circulation and cooling by radiation is prevented and less heat is lost. A collateral hyperaemia occurs in the underlying parts which acts as a protection to the deeper tissues. The cold also inhibits the vaso-motor nerves controlling the abdom-

inal splanchnics and thus a larger amount of blood passes to this immense vascular area. On the other hand, when a warmer bath is used the effect is opposite, and a lowering of the temperature is the result. The cutaneous vessels being dilated, the superficial blood is rapidly replaced by blood from the deeper vessels, thus allowing a cooling of the body to a large degree.

In the various fevers where hydrotherapeutic measures are employed, the object to be gained by such method is not primarily an anti-thermic one but an anti-febrile reaction; consequently the use of cold water is employed. In mere heat reduction the warmer water would be more effective; but by the aid of colder water the cause of the increased temperature, as in infectious fevers, is lessened; besides a refreshing and stimulating effect upon the entire system is gained. Thus the aim of the cold bath and friction, is not primarily to subdue the temperature by heat radiation or evaporation; but to correct disturbances governing the formation and the dissipation of heat caused by infectious fevers; and moreover to stimulate the nervous system, prevent heart failure, increase the eliminating power of the skin, kidneys, and lungs, and to influence the corpuscular and chemical constituents of the blood to a more normal condition.

The full cold bath and friction (Brand Method) is commonly employed in infectious fevers. The half bath, wet pack, or sponging may be employed. The *modus operandi* of each is given under the hydrotherapeutic treatment of typhoid fever.

TYPHOID FEVER.

Synonyms.—Enteric fever; gastric fever; nervous fever; entero-mesenteric fever; abdominal typhus; autumnal fever; ilio-typhoid fever; pythogenic fever; slow nervous fever; nerven fieber.

Definition.—An acute infectious disease due to a special poison; characterized anatomically by hyperplasia and by definite lesions in Peyer's patches, mesenteric glands and spleen and parenchymatus changes in other organs; and clinically by its slow onset, early diarrhoea, abdominal tenderness, tympanites, fever, headache, and rose colored spots on the abdomen. Average duration is from three to four weeks.

Etiology.—*Predisposing causes*—Age between fifteen and thirty years. Autumn months, especially after a hot, dry summer. Some families seem more susceptible than others. Lesions of the lower dorsal and lumbar region are always found. They impair the innervation and vascular supply of the intestines; thus causing defective nutrition to the intestines. This is the most important predisposing cause.

Exciting Causes.—A special micro-organism, the bacillus of Eberth. The contagion may be carried through the air from one person to another, but this is rarely the case. Through the water is the most common mode of conveyance. The bacillus has been found in both water and milk during epidemics. The water may be contaminated by the intestinal discharges which have not been properly disinfected. Extreme cold does not destroy the typhoid germs. Milk may be infected from the milk-can being washed with the contaminated water or the unclean hands of the milker. In fresh milk the germs multiply rapidly. Salads, celery, ice, and fruits, may be contaminated. Oysters may become infected while being fattened or freshened. It is thought by some that the poison is not eliminated from the sick in a condition capable of transferring disease to a healthy person but must undergo changes in the soil before it is able to cause the disease in another. Typhoid fever may be caused, however, by direct contact with the stools. Filth, sewers, or cesspools do not directly cause the disease, but

they form a suitable medium for the preservation of the typhoid germs.

Morbid Anatomy.—The characteristic lesions in typhoid fever consist of changes in the lymphoid elements of the bowels. These changes are most striking in the solitary glands and Peyer's patches. The alterations which occur may be divided into four well defined stages: (1) *Infiltration*—The glands are enlarged from infiltration and there is marked cell proliferation; particularly Peyer's glands in the jejunum and ileum and to a lesser extent those in the large intestines. The glands become pale and prominent. Occasionally the solitary glands which are usually deeply imbedded in the sub-mucosa become prominent also.

Microscopically.—The capillary blood vessels are at first markedly dilated, but later become more or less compressed, giving a whitish anaemic appearance to the follicles. The adjacent mucosa and muscularis may become infiltrated. The cells have the character of lymph corpuscles; some of which are larger, epitheloid in character, containing several nuclei. From the eighth to the tenth day this medullary infiltration reaches its height and then undergoes either resolution or necrosis.

Resolution—Takes place by a granular or fatty degeneration of the cells, which are destroyed and absorbed. This produces pitting of the swollen follicles which may cause small haemorrhages.

(2) *Necrosis*—In all but the milder grades of cell infiltration hyperplasia of lymph follicles reaches a stage where resolution is impossible and necrosis occurs. The necrosis is partly due to the choking of the blood vessels and partly to the direct action of the bacilli. The necrosis may involve only the superficial layers of the mucosa or it may extend deep into the muscular coat and even perforate the outer or serous coat. Usually, however, this does not extend below

the submucous, mucous, or muscularis. Not all of the patches necessarily slough, but as a rule it is always more intense toward the ilio-caecal value.

(3) *Ulceration*—The size and shape of the ulcers are directly proportionate to the amount of the necrosis. Large ulcers are sometimes found, especially in the lower end of the bowel by the union of several. The edges are swollen and undermined. The base is usually clean and smooth and formed of submucosa or of the muscularis. Perforation of the bowels occurs in a small percentage of cases; more commonly the ulcers heal. The perforations may be multiple, but rarely exceed two in number.

(4) *Healing*—Cicatrization begins about the fourth week. This granulation tissue covers the floor. This is sometimes formed with connective tissue and a new growth of epithelium is formed. The gland is ultimately replaced by a depressed scar with a smooth pigmented surface. The majority of deaths occur before this stage is reached. The gland structure is never regenerated.

The mesenteric glands show intense hyperaemia and later become enlarged and softened, but rarely ruptured. The glands at the lower end of the ileum are especially involved.

The spleen is invariably enlarged and softened even diffluent. Occasionally rupture occurs spontaneously or as the result of injury. Infarction is not a rare occurrence.

The liver shows parenchymatous and granular degeneration and the cells are found to be loaded with fat upon microscopic examination. Infarction abscesses and acute yellow atrophy occurs in rare instances. Diphtheritic inflammation of the gall bladder sometimes occurs and the bile is thinner and paler than normal.

The kidneys also exhibit parenchymatous degeneration. They are somewhat pale looking with slight cloudy swell-

ing. Microscopically there is seen granular and fatty degeneration of the cells of the convoluted tubules. Rarely, there is acute nephritis which may be haemorrhagic. There may be miliary abscesses in which typhoid bacilli have been found by some observers. Diphtheritic but more frequently catarrhal inflammation of the pelvis of the kidney may occur. Catarrh of the bladder is not infrequent and even sometimes diphtheritic inflammation is present. Rarely orchitis is encountered.

Hypostatic congestion of the lungs is not uncommon. Gangrene and haemorrhagic infarction are sometimes present. Lobar pneumonia may be found early in the disease.

Pleurisy is not often met with. Fibrinous pleurisy and empyema are rare events.

In the larynx ulceration is sometimes met with; bacilli, however, have not yet been found in these ulcers. Diphtheritis of the pharynx and larynx is not uncommon. Catarrhal or croupous pharyngitis may occur; while swelling of the follicles of the pharynx and base of the tongue is frequently noticed.

Peritonitis is always found in fatal cases in which perforation of the bowel has taken place. The perforation may occur in ulcers from which the sloughs have already separated, or it may be caused by a necrosis of all the coats. Diffused peritonitis may occur without perforation, and is probably due to extension of the inflammation to the peritoneum.

The heart may be affected. Endocarditis is rare, while pericarditis is much more frequent. Myocarditis is frequently met with, the cardiac muscles presenting parenchymatous and rarely hyaline degeneration. It is noticeable that the cell fibres present little or no change even in cases of death from heart failure. The arteries are frequently found to be involved. These conditions (obliterating

arteritis and partial arteritis) may affect the smaller vessels, especially those of the heart, but more commonly affecting the arteries of the lower extremities. Thrombosis of the veins, especially of the femoral and more rarely of the cerebral veins and sinuses occur.

Granular and hyaline changes in the voluntary muscles may occur. This degeneration does not affect the whole muscle but involves only certain fibres. Regeneration takes place during convalescence.

With the nervous system meningitis is exceedingly rare. The peripheral nerves are frequently the seat of parenchymatous changes even when there have been no symptoms of neuritis. The ganglia of the trunks of the vagi present an inflammatory change.

The blood presents little change. During the first two weeks the red corpuscles gradually decrease in number until the first week of convalescence, after which they gradually increase in number. There is often a marked decrease in the number of leucocytes. Leucocytosis is absent. The haemoglobin is always reduced.

Symptoms and Course.—The incubation period varies from a few days to two weeks or longer. During this time the patient may feel in his usual health but more often there is a feeling of languor and indisposition to exertion, loss of appetite, slight coating of the tongue, nausea, headache, chilliness, but seldom a decided rigor, pains in the back or legs and nose-bleeding. Any of these symptoms may be present and last usually from a few days to a week or more. These symptoms increase in severity and the patient takes to his bed. The invasion as a rule is gradual. The *first week* dates from the onset of the fever which generally (but by no means in all cases) rises steadily during the first week a degree or a degree and one-half each day, reaching 103 or 104 degrees F. The pulse is quickened 90 to 110

per minute and is full, of low tension and sometimes dicrotic. There is great thirst and a coated tongue. The skin is hot and dry and there is rather intense headache. Unless the fever is high there is no delirium. The sleep is disturbed and there may be mental confusion and wandering. Cough with some thoracic oppression is not uncommon at the onset. The abdomen is slightly distended and tender. The bowels may be constipated or there may be three or four loose movements a day. The spleen is somewhat swollen and a rose colored rash appears on the skin of the abdomen and chest.

Second week—The fever remains high and exhibits the continued type, the morning remission being slight. The pulse is accelerated and loses its dicrotic character. The headache disappears, but there is marked mental dullness and slowness and there may be a mild delirium at night. The tongue is coated and may be dry, also the lips are dry. The abdomen is tympanitic and tender. Diarrhoea replaces constipation. The case may prove fatal during this week from the result of pronounced nervous or pulmonary symptoms, haemorrhage, or perforation.

Third week.—The pulse ranges from 110 to 130. The fever changes from a continuous to a remittent type. Loss of flesh is now more marked and weakness is pronounced. Unfavorable complications may arise during this stage, as pulmonary symptoms, increased feebleness of the heart, intestinal haemorrhage, perforation, and peritonitis.

Fourth week—In favorable cases the fever begins to decline and the general and local symptoms gradually disappear. The diarrhoea stops, the tongue clears and the patient wants food. In protracted cases the fourth and fifth weeks may present the symptoms of the third week. Frequently the following aggravated symptoms being added, stupor, low muttering delirium, subsultus, increased weak-

ness, rapid feeble pulse, dry tongue, distended abdomen, and urine and faeces are passed involuntarily. Heart failure and inflammatory complications increase the danger.

During the fifth and sixth weeks a few cases still show irregular fever. About this time relapses or slight recrudescences of the fever may occur.

Special Features and Symptoms.—The fever is the most important and characteristic symptom and from the temperature alone a diagnosis may be made. During these stages of development, which is the first four or five days, the temperature rises steadily; the evening temperature being about a degree or a degree and one-half higher than the morning remissions, reaching 104 or 105 degrees F. at the end of the first week. When the fastigium is reached the fever persists with slight morning remissions. At the end of the second and throughout the third week the temperature becomes more remittent and there may be a difference of three or four degrees between the morning and evening temperature. During the last stage the fever falls by lysis, forming a more or less regular step-like line of descent. The stage lasts from one week to ten days.

Abnormal Course of the Fever.—When the disease sets in with a severe rigor the fever frequently rises at once to 103 or 104 degrees F. The first stage of the gradual step-like ascent is rarely seen by the physician, as the cases do not come under his care at this early stage. In the lightest forms the fastigium may be almost absent; defervescence setting in upon the first day of the fastigium and in many cases defervescence occurs at the end of the second week and the temperature may fall rapidly, becoming normal in ten or twenty hours. This fall in the temperature may take place without any apparent cause or it may follow an intestinal haemorrhage. The temperature often falls many

hours before the blood appears in the evacuations. The occurrence of peritonitis is also marked by a sudden fall in the temperature. Hyperpyrexia in typhoid fever is not very common except just before death.

Post-Typhoid Elevation.—After the fever has become normal for several days there may be a sudden rise of the temperature to 102 or 103 degrees F. This may persist for a couple of days and then return rapidly to the normal. These recrudescences as they are called are quite common and are caused most frequently by errors in the diet, constipation, excitement or mental emotion. These elevations in the temperature are found most frequently in children and persons of a nervous temperament.

Afebrile Typhoid.—This is of very rare occurrence. The patient has all the characteristic symptoms of typhoid fever with the exception of a fever.

Skin.—The rash is highly characteristic. It appears about the eighth or tenth day, usually upon the skin of the abdomen and chest, rarely found elsewhere on the body. They consist of a variable number of rose colored spots distinctly elevated and disappear on pressure. These spots last three or four days and appear in successive crops. Vivid red erythematous eruptions upon the chest and abdomen are commonly seen during the first week of typhoid fever. Urticaria is rarely seen.

Sweating characterizes some cases of typhoid fever but generally the skin is dry. This may occur with or without chilly sensations or actual rigors. In some cases there may be recurring paroxysms of chills, fever, and sweats and they may be mistaken for intermittent fever. Oedema of the skin may occur and is usually due to anaemia or cachexia and sometimes to nephritis. Local oedema may occur as the result of vascular obstruction particularly thrombosis of the femoral vein. There is a peculiar musty odor exhaled

from the skin in typhoid fever, particularly if the skin has been neglected. In all protracted cases bed-sores are likely to develop. The hair is apt to fall out but is generally renewed. The nails also suffer and ridges can usually be observed upon them.

Digestive System.—Intestinal symptoms are very inconstant. Usually there is constipation at the onset and this may persist throughout the disease although a moderate diarrhoea may occur throughout the disease. The severity of the diarrhoea is due most probably to the degree of the catarrh rather than to the extent of the ulcers. It is probable that the discharges are more frequent when the catarrh involves the large intestines. The number of discharges average as a rule from two to four or more daily.

The stools are either fluid or of the consistency of jelly of a grayish-yellow color, alkaline in reaction and are very offensive. On standing they separate into two layers. A thin serous layer containing albumin and salts, and a lower thick yellow sedimentary layer consisting of remnants of food, epithelial debris, crystals of triple phosphate, blood corpuscles, grayish-yellow fragments (sloughs of Peyer's glands) and innumerable bacteria.

Haemorrhage from the bowels is a serious symptom but by no means always fatal. This usually occurs in cases of considerable severity and it generally occurs at the time of the separation of the sloughs during the third week. When it occurs quite early in the disease it is generally the result of intense hyperaemia. It may be so slight as not to be noticed by the eye or it may be from one to three pints. Intestinal haemorrhage however slight is always a grave symptom and it usually comes on without warning; or the patient may experience a sensation of sinking or collapse and the temperature falls.

Meteorism is an almost constant symptom and when ex-

cessive adds to seriousness of the case and corresponds generally with the extent of local lesions. It pushes up the diaphragm and interferes with the action of the heart and lungs. It also favors perforation. Abdominal tenderness and gurgling upon pressure in the right iliac fossa may be present; pain is generally absent and when present is usually slight.

Perforation invariably causes fatal diffused peritonitis and is the most serious complication. It may occur at any time but is most common between the second and fourth weeks. It is usually indicated by sudden acute pains in the abdomen and symptoms of collapse. As a rule symptoms of peritontitis appear at once, also, distention of the abdomen, great tenderness, and rigid abdominal walls. Vomiting, pinched features, and rapid small pulse show general collapse of the circulatory system. Recovery is rare but is certainly possible. Peritontitis may occur without perforation by extension of inflammation from the ulcers.

The *spleen* is invariably enlarged and generally goes on increasing in size till the beginning of the third week. The edge is felt just below the costal cartilages. Rupture of the organ may occur spontaneously or as the result of a slight blow, but this is of rare occurrence. Infarcts and abscesses are sometimes found.

The *liver* can sometimes be felt to be enlarged. Jaundice and abscess of the liver are rare complications.

Gastric Symptoms.—Nausea and vomiting may occur at any stage of the disease but is most common at the onset. Persistent vomiting is a serious symptom and death may occur from exhaustion.

The pharynx is frequently the seat of catarrhal irritation. There may be merely a dry burning sensation. The tongue at first is moist, swollen, and coated with a thin white fur;

later the edges clear off while the center becomes very dry and covered with a brown or brownish-black fur. It is sometimes fissured. The lips become dry and the lips and teeth may be covered with dry black crusts called sordes. Ulcerated stomatitis often occurs if the mouth is not kept clean. Parotitis is not infrequent and the sub-maxillary gland may be also involved.

Respiratory System.—Epistaxis appears early in most cases and is the most common febrile affection. When it occurs during the fastigium it is a grave symptom. Laryngitis is an occasional complication. Laryngeal ulcers and perichondritis may occur.

Bronchitis is almost invariably present as an initial symptom. It is indicated by the existence of sibilant râles. The cough is generally slight.

Hypostatic congestion of the lungs and oedema due to enfeeblement of the cardio-pulmonary circulation in the latter part of the disease is not infrequent. The physical signs are defective resonance or dullness at the bases, broncho-vesicular breathing, and moist râles.

Lobar pneumonia in a few cases develops early. There may be a marked rigor at the onset, sudden rise in temperature, pain in the side, and all the symptoms of lobar pneumonia; characteristic typhoid symptoms however soon follow and the pulmonary symptoms soon leave. Lobar pneumonia frequently develops during the second or third week when it forms a serious complication. The symptoms are not marked; there may be no rusty expectoration, chill, or pain in the side and hence the condition is easily overlooked. Pulmonary infarction, abscess or gangrene of lungs are occasional complications.

Circulatory System.—The heart sounds are at first natural, but in severe cases the first sound may grow quite feeble or be gradually annihilated. Sometimes a soft systolic

murmur is heard at the apex. Pericarditis and endocarditis are rare complications while myocarditis is more common.

The pulse as a rule is not very frequent and is generally not in proportion to the fever until late in the disease, 90 to 120 is the usual range. During the first week it is about 100, full, and frequently dicrotic; later it becomes more rapid, feeble and small. In severe cases during the extreme debility of the third week the pulse may reach 150 or more (the so-called running pulse). During convalescence the pulse occasionally becomes subnormal and brachycardia is met with more frequently than after any other acute fever.

Venous Thrombosis occurs most frequently in the left femoral vein. This complication is not a very unfavorable one but occasionally the thrombosis may extend into the pelvic veins or even into the vena cava which makes it more serious. Sudden death has been caused by detachment of a thrombus. Thrombosis of the femoral vein causes swelling and oedema of the affected limb. Gangrene however never results from obstruction of the vein above.

Obliterations of the large or small arteries is a rare complication and may be due either to embolism or to thrombosis. As a general rule it is the femoral artery that is involved and gangrene of the foot and leg is the result. It is not known whether the thrombosis is caused by a peculiar condition of the blood which favors clotting or to a local arteritis, possibly it is a combination of these two factors.

The blood presents certain changes some of which are important. In cases where there is profuse sweating or copious diarrhoea the red corpuscles may be relatively increased; this is due to the loss of water. In most cases there is little change until the end of the second week. During the third week there is generally a decrease in the number

of corpuscles and of the haemoglobin, which is always reduced. Leucocytosis is always absent. The white corpuscles are slightly diminished especially toward the end of convalesence.

Nervous System.—During the first week there is generally persistent headache, sometimes neuralgia. There are a few cases in which the effects of the typhoid bacilli or their poison is manifested in the nervous system from the very onset. There are violent headaches, retraction of the head, rigidity, photophobia, twitching of the muscles, rarely convulsions, all indicating meningitis for which it is invariably diagnosed. It must be remembered however that all nervous symptoms may occur independently of a lesion of the nervous system.

Delirium may exist from the onset but it usually is not present until the second or third week and only in the severer cases. As a rule it is most marked at night. It is generally of the low, muttering type, very seldom maniacal. When the patient picks at the bed clothes or grasps at imaginary objects there is indication of danger as it is a serious symptom. Convulsions are rare.

Of the nervous complications and sequalae, paralysis is the most common and is due to neuritis. Extreme sensitiveness of the skin and muscles is common during convalescence. Mental weakness and even insanity may follow and is more common after typhoid than after any other disease. This is probably due to impaired nutrition and weakening of the nervous centers. Neuralgia affecting the occipital and cranial nerves is frequent both during and after the disease.

Renal System.—The urine is diminished in quantity, high specific gravity, and of dark hue. Both urea and uric acid are increased and the chlorids are diminished during the first stages. About the stage of decline the urine becomes

light in color and greater in quantity than normal. The specific gravity is diminished, urea and uric acid are diminished, and the chlorids are increased. Febrile albuminuria is very common but of no special significance. Acute nephritis may develop as a complication. Diabetes mellitus in rare cases may develop after typhoid. Pyuria is not an uncommon complication and post-typhoid pyelitis may also develop. Simple catarrh of the bladder is rare. Orchitis is sometimes met with during convalescence.

Osseous System.—A multiple arthritis occasionally occurs. Mono-articular arthritis is more common and often precedes to suppuration. Necrosis of the bones may occur during the fever but usually it is during convalescence. The favorite seat being the ribs and tibia.

The muscles may be the seat of hyaline degeneration and abscesses may form in the muscles.

Associated Acute Diseases.—Erysipelas is a rare complication coming on most frequently during convalescence, although it may appear during the height of the affection.

Malarial fever may be associated with typhoid, especially in malarial districts. Persons with tuberculosis, epilepsy, chorea, and other forms of chronic nervous diseases are liable to typhoid fever. In epilepsy and chorea the movements and fits usually cease during the attack of typhoid fever.

Pseudo-membranous inflammation may occur in the larynx, pharynx, and genitals. Measles, chicken pox, and scarlatina may also arise.

Varieties of Typhoid.—These are numerous and are named with reference to the degree of severity which varies from extreme mildness to extreme severity.

The Mild or Abortive Form.—There are a great many cases of this variety. The onset is usually sudden. The symptoms are similar to those of a typical case but much

milder and appear earlier than in the usual type. This form runs its course in about two weeks. The fever usually reaches 104 degrees F.

Severe or Grave Form.—There will be high fever and nervous symptoms showing profound intoxication of the system. The grave types are those associated with serious complications or those cases which set in with pneumonia, Bright's disease, or cerebro-spinal symptoms.

The Latent or Ambulatory Form (walking typhoid).—In this form the symptoms are very slight, the patient being hardly sick enough to go to bed. The symptoms may be of this character throughout the attack or the patient may be able to be up and about. In other cases the first symptoms are very mild but later they may develop symptoms of the severest type..

The Afebrile form is exceedingly rare but has been recognized by authors. Haemorrhagic typhoid is a very fatal but rare form. In this type there are cutaneous and mucous haemorrhages.

Diagnosis.—As a general rule typhoid fever is easily recognized. At times the diagnosis may have to be delayed until the distinctive signs appear, especially in those cases which come on with severe headache, delirium, twitching of the muscles, and retraction of the head. In these cases the diagnosis of cerebro-spinal meningitis is invariably made; until the appearance of the rose colored spots on the abdomen which must decide the diagnosis; cerebro-spinal meningitis being a very rare disease and typhoid fever with severe nervous symptoms quite frequent it is more probable that it is typhoid. At least one-half of the cases termed brain fever belong to this class of nervous typhoid.

Prognosis.—A positive prognosis can not be made as even the mildest cases are liable to have severe complications develop at any stage of the disease. The prognosis is

always more favorable in winter than in summer, and especially favorable in children. More women die than men, and fat persons stand the disease badly.

Treatment.—It has taken the medical profession many years to realize that typhoid fever can be successfully treated without drug medication, but at last they have yielded. Since they have seen to a slight extent what can be done without drugs perhaps they will not be so reluctant in giving up their fond but useless theories in the future.

Prophylaxis.—Typhoid fever as a rule is a preventable affection. Modern hygienic resources enable a community to reduce the number of cases to a minimum. The number of cases in a locality depend almost directly upon the condition of the water supply and drainage. Care should always be taken in regard to the source of drinking water and milk. During an epidemic the water and milk should be boiled for half an hour before being used. The patient should be isolated. In hospitals they should have special wards; in families a special apartment should be given them. Hygienic principles should be followed as in other infectious diseases.

The methods of disinfection must be rigid to prevent the spread of an infection. The excreta (stools, urine, vomitus, and sputum) are to be received into a bed-pan or any appropriate receptacle containing half a pint of carbolic acid (one to twenty). Three or four pints of the carbolic acid (one to twenty) should then be added to the bed-pan and the contents mixed carefully before emptying. All utensils used in handling the excreta are to be carefully disinfected by the same material, and dried. After every stool the nates of the patient should be cleansed by a cloth compress, wet with a solution of carbolic acid (one to forty) and the cloth burned. The sick room should be thoroughly ventilated each day. All utensils used about the patient in feeding

should be boiled in water immediately after using. The bed and body linen is to be changed as soon as soiled and these with all changed bath towels, blankets and rubber sheets should be received in a sheet rinsed in carbolic acid (one to forty) and placed where they may be soaked in the solution for four or five hours. The clothes are to be boiled for half an hour. The rubber blanket is to be washed in the solution, dried and aired.

General Management.—Careful nursing and a regulated diet are of paramount importance in the treatment of typhoid fever. The patient should be placed in bed as soon as the disease is determined and there remain until the end of the attack. The room should be well ventilated and have a sunny exposure if possible. The single woven wire bed with soft hair mattress with two folds of blankets is best. A rubber cloth should be placed smoothly under the sheet. When a good nurse cannot be had the attending physician should write out directions regarding diet, bed linen, and utensils, and the disinfection of the excreta.

Diet.—A liquid diet should be administered of which milk is most commonly used; care being taken that it is thoroughly digested. If milk is not borne well by the patient other foods as whey, sour milk, buttermilk, and broths may be substituted. Give food that is easily digested and which leaves but little residue. When milk is used alone three pints at least may be given to an adult in the course of twenty-four hours; and it should always be diluted, preferably with plain water. Beef juice, mutton or chicken broths may also be used when milk is not agreeable. Albumin water prepared by straining the white of eggs through a cloth and adding an equal amount of water is an excellent food. Well strained thin barley gruel is considered by many an excellent food for typhoid fever patients. Cases not able to take nourishment into the stomach on ac-

count of vomiting and other causes should be fed rectally to support life.

The best drinks for fever patients is pure cold water and they should be encouraged to drink freely of it. Barley water, ice tea, lemonade, or even moderate quantities of coffee or cocoa may be given.

Hydrotherapy.—There are several beneficial effects obtained by hydrotherapeutic measures that should receive careful consideration. Probably it is of the least significance to lower the temperature; other beneficial effects being of greater importance. When the baths are systematically carried out there is obtained (1) a general improvement of the nervous system, the mind is rendered clear, muscular twitchings are lessened, sleep is induced and the heart's action strengthened; (2) the respiration is stimulated thus diminishing the liability of lung complications; (3) the activity of the renal function is increased, consequently allowing more rapid elimination of toxic matter; (4) reduction of the temperature; and overcoming ill effects of high fever.

A cold water bath or what is generally termed the Brand method is commonly employed. The following plan is usually followed. When the temperature is above 102.5 degrees F., rectally, a bath of 70 degrees F. is wheeled to the patient's bedside and he is placed into it for ten or fifteen minutes. The patient should be lowered into the bath by means of a sheet. Enough water is used to cover the body and neck of the patient. The head is sponged and the limbs and trunk are rubbed thoroughly during the entire procedure. When the patient is taken out he is wrapped in a dry sheet and covered with a blanket. This procedure is gone through with every three hours if the case is severe, otherwise once every seven or eight hours will be sufficient.

The luke-warm bath is occasionally used in private practice when one is unable to use the Brand method. A

bath of 90 degrees F. is employed which is gradually cooled ten or twelve degrees, after the patient has been placed in it, by pouring cold water on the patient. This bath is found very helpful. Also in private practice the cold pack is found satisfactory. The patient is wrapped in a sheet wrung out of water at 65 dgrees F and cold water is sprinkled over him Whenever there is objection to any of these methods the body may be sponged off with tepid or cold water when the temperature rises above 102.5 degrees F., rectally. One limb should be taken at a time and then the trunk, occupying altogether, some twenty or thirty minutes.

Osteopathic Treatment.—I believe cases of typhoid fever may be aborted if treated correctly during the first week. If the stage of necrosis of Peyer's patches has set in one's only hope can be to lessen the severity of the attack. During the stage of infiltration proper treatment to the intestinal splanchnics (chiefly from the 9th to the 12th dorsals, the innervation to the jejunum and ileum) and careful treatment over the abdomen is indicated. This treatment will tend to lessen the intestinal catarrh and diminish the infiltration and cell proliferation of the lymphoid elements of the intestines; and thus render unfavorable the circumstances that are necessary for the bacillus of Eberth. In other words increase the tone and activity of the intestines so that the micro-organisms of typhoid fever will not find the proper tissue-soil in order to grow and multiply.

All cases of typhoid fever present lesions in the dorsal or lumbar spine and this is really the great predisposing cause of typhoid fever. Correcting these lesions is absolutely necessary in order to abort the disease. Some patients may have such a lowered vitality to begin with that the recuperative powers of the body could not be rendered forceful enough in a short time to combat the effects of the micro-organism.

After the disease has become thoroughly established I always make it a point during each visit to the patient to examine the entire length of the spinal column carefully and readjust any tissue, whether it be vertebra, rib, or muscle, that I may find disordered. The bowels are to be watched carefully and if constipated they should be moved with a light enema. Great care must be taken and not treat the abdomen roughly if at all after the first week. The treatment might be very injurious to the structures diseased. A light treatment over the liver and kidneys each time is a wise precaution. The heart's action should be watched carefully. In addition to the hydro-therapeutic treatment the general fever treatment should be employed.

Special Symptoms.—Abdominal pain is best relieved by light treatment over the abdomen and by thorough treatment of the lower dorsal or lumbar region. Applications of hot water will be helpful.

Meteorism can be relieved by raising the lower ribs and by direct treatment to the abdomen. A change of diet may be beneficial. When the gas is in the large bowel an enema may be given to remove it.

Diarrhoea and constipation are best controlled by the usual treatment given the spine in such cases, and over the abdomen and the liver. Light enemata may be given for constipation. The stools should be examined when diarrhoea occurs as the presence of curds may cause the aggravation.

Haemorrhage from the bowels demands absolute rest and a careful use of the bed-pan. It is probably better to have the patient use the draw sheet for the evacuations. Immediate and thorough treatment must be given to the spinal column in the region of the intestinal nerves to the diseased area so that existing lesions may be corrected and the vascular area of the mesentery equalized. Ice should be given

freely and an ice pack placed over the abdomen. Food should be restricted for ten or twelve hours. If the peristalsis of the intestines is increased an effort should be made to control it through the vagi and splanchnic nerves.

When peritonitis occurs from perforation the case is usually hopeless, although recovery has taken place. The indications are to lessen the inflammation. Hot applications, rest and thorough treatment of the innervation to the peritoneum is necessary.

Insomnia is best relieved by attention to the cervical region. Relaxation of the muscles in this region and a quieting treatment to the posterior occipital nerves, coupled with cold baths, will usually induce sleep.

In delirium attention to the circulation of the brain by careful treatment of the vaso-motor system and the Brand method of baths will relieve this distressing symptom.

Management of Convalescence.—The patient should be restricted from any mental or physical exercise for a week or ten days and then should move about with care. Solid food should not be given for ten days or two weeks. The question of food is a troublesome one, for the patient has a ravenous appetite and is extremely anxious for a fuller diet. If the temperature has been normal for ten days it is then safe to allow such food as eggs, milk puddings, and milk toast. If diarrhoea should persist, being due to ulceration, the diet should be restricted and the patient confined to the bed. If constipation is troublesome relieve it by enemata.

MOUNTAIN FEVER.

Synonym.—Mountain sickness.

Definition.—A form of fever which develops in high altitudes; characterized by moderate fever and a group of symptoms due to the effects of a rarefied air upon the respiration and circulation.

There is no definite etiology or morbid anatomy.

Symptoms.—The pulse is quickened, severe headache, gasping for breath, vertigo, sometimes nausea and vomiting, debility, and as a rule constipation, with diarrhoea may occur. Epistaxis sometimes occurs.

The duration is from two to four weeks. Some authorities consider this a form of typhoid fever accompanied by the varied symptoms, due to the effect of high altitudes upon the organic functions. It must be borne in mind that high altitudes frequently alter the characteristic symptoms of the acute infectious diseases.

Treatment.—The treatment of mountain fever is largely symptomatic. For special indications see treatment of typhoid fever.

TYPHUS FEVER.

Synonyms.—Ship fever; camp fever; jail fever; pestilential fever; spotted or putrid fever; petechial fever; typhus exanthematicus; contagious fever.

Definition.—An acute infectious disease; characterized by sudden invasion, high fever, marked nervous symptoms, a peculiar maculated and petechial eruption and a termination by crisis about the fourteenth day.

Etiology.—Typhus fever is becoming less frequent than formerly and is rarely seen in this country. Filth, overcrowding, famine, intemperance and bad food are the predisposing causes. Although it is an infectious disease no

special micro-organism has yet been found. Typhus fever is highly contagious but it is not yet known in what manner the contagion is transmitted. It is more probable that the poison is inhaled and enters the system through the respiratory tract.

Morbid Anatomy.—There are no constant lesions. There is a general hyperplasia of the lymph follicles but no ulceration. The blood is dark, thin and lessened in fibrin. Hypostatic congestion of the lungs and bronchial catarrh are frequently met with. The liver, kidneys and spleen are found to be somewhat enlarged and softened. The petechial rash remains after death.

Symptoms.—*Incubation period*—This lasts about twelve days, sometimes less. The invasion is usually sudden, ushered in by either a series of chills or a single rigor. The temperature quickly rises to 104 or 105 degrees F. There is headache, pains in the muscles, especially of the back, and early profound prostration. The pulse is at first full and strong but soon becomes weak and frequent. There may be distressing vomiting. The face is flushed, the eyes injected, the expression stupid, and there is generally low muttering delirium. The tongue is furred and white, soon becoming dry. The bowels are constipated and the urine is usually scanty and of high specific gravity. There is great thirst.

Stage of Eruption.—The eruption appears about the third or fifth day. It first makes its appearance upon the abdomen and chest. It rapidly extends all over the body with the exception of the face. The eruption is of two kinds—rose spots, which disappear upon pressure, and those which become haemorrhagic (petechial); pressure has no effect upon them. During the second week the symptoms become more aggravated. The tongue is dry, brown and fissured, and sordes appear on the teeth. Retention of

the urine, due to paralysis of the bladder, is common. The breathing becomes more rapid and the heart's action more feeble; the patient may die from exhaustion. In favorable cases the crisis occurs at the end of the second week.

Convalescence is usually rapid, relapses rarely occur. The urine is scanty, high colored and frequently albuminous. Bed sores are common. The temperature continues high, reaching 106 degrees F., or more with slight nocturnal remissions. In fatal cases the fever often rises to 108 or 109 degrees F. just before death.

Complications and Sequelae.—Broncho-pneumonia is a frequent complication as well as swollen parotid glands. Gangrene, meningitis and paralysis sometimes occur.

Diagnosis.—The sudden onset, frequent chills, early profound prostration, character of the rash, history of exposure to the poison and unhygienic surroundings decide the diagnosis. During an epidemic there is usually no doubt, but in sporadic cases the diagnosis is sometimes extremely difficult.

Prognosis.—This is usually grave, but the mortality rate is being greatly reduced in consequence of the better sanitary arrangements.

Treatment.—Typhus fever is highly contagious and great care should be taken in controlling the disease. I do not know of any osteopaths that have had experience in the treating of typhus fever osteopathically, but I cannot see any reason why the disease should not be treated with the same success as met with by osteopathic treatment in other diseases. It is claimed that the disease should be treated in the open air, in tents, as the recovery of the patient and the safety of the attendants are greatly favored.

The osteopath would here, as in all cases of diseases, examine the patient for anatomical disorders and whenever any are found would proceed to readjust them. There are

no lesions that are characteristic of typhus and consequently the treatment of the disease would of necessity be largely a symptomatic one. Isolation is necessary and the patient's excreta should be removed and disinfected at once.

For high temperature, besides the treatment given to remove any disorder that may be found, the general fever treatment is indicated, and hydrotherapy would also be of aid, by sponging the surface of the body or by the use of the bath. Asthenia is wherein the greatest danger lies, and a stimulating treatment along the spine and to the heart should be given; although correction of the primary trouble may be sufficient. Hydrotherapeutic measures, the systematic use of the cold bath, would be of service the same as in typhoid fever.

Headache and delirium which are apt to arise caused by too much blood in the head may be relieved by treatment of the cervical spine. Also cold applied to the head will aid. The bowels should be watched carefully, treat the splanchnics thoroughly and the intestines and liver directly. Nourish the patient as in typhoid fever by nutritious liquids—milk, broths, etc.

RELAPSING FEVER.

Synonyms.—Febris recurrens; relapsing typhus; famine fever; seven-day fever; typhus icterodes.

Definition.—An acute infectious disease caused by the spirillum of Obermeieri; characterized by febrile relapses, separated by periods of complete remission. The febrile paroxysm usually lasts about six days and the remissions are of about the same length of time. This may occur three or four times, hence the name relapsing fever.

Etilogy.—It is now generally acknowledged that the specific cause of relapsing fever is a special organism, the spirochaeta Obermeieri. It is a contagious disease and the

predisposing causes are famine, filth, overcrowding, and poor food. It is, however, not entirely confined to the poorer classes. Age, sex, or season have no special influence.

Morbid Anatomy.—The most constant changes appear in the spleen, which is large and soft. The changes in the other organs correspond with those found in typhus fever, but are neither constant nor characteristic.

Symptoms.—The *incubation* period is from four to fourteen days; but sometimes the disease develops immediately after exposure.

The *invasion* is abrupt with a chill, intense pain in the back and limbs, fever, and headache. The temperature rises rapidly, reaching 104 or 105 degrees F. The pulse becomes rapid, ranging from 100 to 140. The tongue is at first moist and furred, but later it becomes brown and dry. There is sordes on the teeth. There may be nausea, vomiting, and sometimes convulsions in young persons. Delirium is not common. Jaundice sometimes appears, sweats are common, and herpes may be present. Enlargement of the spleen is easily detected and sometimes the liver is found to be slightly enlarged.

The *crisis* usually begins with sweating and sometimes with diarrhoea. This generally occurs about the fifth or sixth day, but may be as early as the third or not until the tenth day. The temperature rapidly falls to normal or even sub-normal. Convalescence is rapid. Within a week, usually about the fourth day from the first chill, there is another chill and the attack repeats itself. The relapse usually being a little shorter than the first attack. The second crisis occurs about the twentieth day. Sometimes there is no relapse, the disease ending with the first crisis. Generally, however, there are two or three relapses, or even four or five may occur. One attack does not secure immunity from subsequent attacks.

Complications.—Complications are not frequent. Nephritis, pneumonia, bronchitis and haematuria may occur. The spleen may become so enlarged that it ruptures. In pregnant women abortion usually takes place. Post febrile paralysis may occur and opthalmia has followed certain epidemics.

Diagnosis.—At first the symptoms may not be distinctive, as they are not unlike those of typhus fever. The sudden onset, the course of the fever terminating about the seventh day by crisis, and the peculiar manner in which the successive paroxysms of fever follow after the period of total remission distinguish relapsing fever from all other affections. The examination of the blood and the finding of the spirillum will decide all doubtful cases.

Prognosis.—This is generally favorable, as relapsing fever is not a very fatal disease. The prognosis must be guarded as dangerous complications may arise.

Treatment.—It must be treated like any of the continued fevers, by careful nursing, dieting, treatment of the organs and tissues found involved, and hygienic measures. Particular attention should be given the secretions. The liver, spleen and kidneys should be thoroughly treated. The fever, nervousness and other symptoms may be treated in addition to the ordinary treatment by the cold bath or by sponging as in typhoid fever. Thorough treatment should be continued during the remission and the system kept well stimulated.

MALARIAL FEVER.

Synonyms.—Ague; chills and fever; fever and ague; swamp fever; marsh fever; bilious fever.

Definition.—An infectious disease caused by the haematozoa of Laveran. The varieties of malarial fever are: intermittent fever; pernicious intermittent; remittent fever;

malarial cachexia; masked intermittents; malarial haematuria.

Etiology.—Malarial fevers are believed to be caused by a protozoon known as the haematozoa of Laveran. Three varieties of the parasite have been separated corresponding with the three leading clinical forms of the affection. The parasite of *tertian* fever is about as large as a normal red blood corpuscle beginning as a small hyaline amoeba in the red blood corpuscles. The parasite of *quartan* fever is very similar in its appearance to the tertian parasite but smaller; its amoeboid movements are slower and the red blood corpuscles embracing it shrinks about the parasite assuming a deeper greenish color. The parasite of the *estivo-autumnal* fevers is still smaller. Only in the earlier stages of development small hyaline bodies are to be found in the peripheral circulation; being found in the later stages in the blood of certain internal viscera. spleen, and bone marrow, particularly.

Soil.—Malaria is seen particularly in low, marshy regions which have an abundant vegetable growth; low river banks that are covered with water at certain seasons and exposed to the sun at other seasons; hot climates, hot seasons, decomposing vegetable matter, low lying estuaries, the deltas of rivers, and the course of old river beds are generally accepted as essential to the development of the malarial poison. This is not always the case, however, and it is an error to regard all marshy districts as being malarial, for malaria may occur over a sandy soil, or even rock beds; but a high temperature is always necessary to its production. Both sexes of all ages are alike susceptible. The malarial poison does not rise far above the earth's surface and persons living in the upper stories of a house or living on slight elevations of the ground are not affected by the poison.

Currents of air may carry the miasm from place to place. A temperature of over 65 degrees F. is one of the essential conditions for the development of the virus. Moisture is also essential, but if either the heat or moisture is excessive the development is arrested for a time. In temperate regions most cases develop in September and October, and sometimes November. In the tropics the disease is more prevalent in the spring and autumn.

The osteopathic physician upon examination of cases of malarial fever finds that the vaso-motor nerves to the spleen and liver are involved. The derangement is lesions in the vertebrae and ribs (8th to 11th dorsal); these lesions undoubtedly produce involvement of the organs and a consequent debility of the blood tissues making them unable to resist the malarial infection.

Morbid Anatomy.—The chief morbid changes are due to the direct effect of the malarial parasite upon the blood. There are also changes in the liver, kidneys and spleen, which changes usually vary with the duration and intensity of the disease. The disintegration of the red blood corpuscles, accumulation of the pigment thus formed and the toxin engendered by the malarial parasite are responsible for the morbid lesions of the disease.

Pernicious malaria.—The blood is more or less hydraemic and the serum may be tinged with haemoglobm. The blood discs are seen in all stages of destruction. The spleen is enlarged, soft and the pulp dark from the accumulation of the pigment. The liver is swollen and turbid; pigmentation occurs, but is generally only visible by means of the microscope. By the aid of the microscope all the tissues of the body, even the brain, may be found to be pigmented.

Chronic malaria.—The spleen is greatly enlarged, firm, pigmented and the capsule thickened.

The liver is enlarged, the color varying from a slight

gray to a deep slate gray, according to the amount of pigment.

The kidneys may be enlarged and deeply pigmented, as is also the mucous membrane of the stomach and intestines.

Intermittent Fever—Symptoms.—This form is what is known as fever and ague, in which chills, fever and sweat follow each other. The period of incubation varies from six to fifteen days, but it may be months after exposure before the first paroxysms set in. The paroxysm is usually preceded by a feeling of uneasiness and discomfort, sometimes by nausea or headache. The paroxysm consists of three stages, cold, heat and sweating.

The cold stage.—The chill usually begins gradually; it is generally intense, the teeth chatter and the body shakes violently. The skin is cool and pale, the lips are blue, the face is pinched and the patient looks very cold.

During the chill the temperature rises rapidly. Nausea, vomiting and headache are common during this stage. The pulse is frequent, small and hard. The urine is increased in quantity and of low specific gravity. The chill lasts from a few minutes to a couple of hours.

The hot stage.—The hot stage succeeds the chill. The skin gradually loses its coldness and becomes intensely hot. The face is flushed, there is great thirst, the mouth is dry, and the tongue is coated. Usually at the termination of the chill the temperature has reached its maximum level, from 104 to 106 degrees F. The pulse is full and bounding and there may be a throbbing headache. The duration of this stage is from half an hour to three or four hours.

The sweating stage.—Drops of perspiration appear upon the face; the perspiration soon becomes profuse, extending all over the body. The temperature soon falls, the headache disappears and in a couple of hours the paroxysm is over and the patient falls asleep. The sweating varies

greatly; it may be a very light moisture or it may be drenching. The entire duration of the paroxysm is from ten to twelve hours; the patient usually feeling perfectly well between the paroxysms. The spleen is enlarged. Herpes labialis appear. If the paroxysms of fever occur daily at the same hour they are called quotidian intermittent fever; if every other day they are known as tertian intermittent; and if every third day they are called quartan intermittent. If there are two paroxysms in the same day the term double quotidian is used; if the paroxysm occurs a couple hours later each successive day they are called "retarding;" if a couple hours earlier they are named "anticipating."

Remittent or Continued Fevers—Aestivo-Autumnal Fever. This is characterized by a continued fever with paroxysmal exacerbations and remissions. It occurs especially in warm and tropical climates and chiefly in the late summer and fall. It is also termed bilious remittent fever on account of the intensity of the gastro-intestinal manifestation. The aestivo-autumnal parasite is the exciting cause.

Symptoms.—It is very often preceded by malaise, headache, nausea and vomiting. The onset is usually gradual and the chill may be wholly absent. As a rule, however, a *chill* generally occurs at the onset but it is less severe than that of intermittent fever. After the chill the *temperature rises* rapidly to 104 or 106 degrees F. The pulse is full, rising to 100 or 120. There is violent headache, flushed face, pains in the limbs and loins, nausea and vomiting and delirium when the temperature is very high. The urine is scanty or even suppressed, slightly albuminous, sometimes bloody, high colored, and deposits a sediment of urates. Jaundice is not infrequent; the spleen is enlarged and herpes labialis is quite common.

Sweating stage.—After six to twenty-four hours the symptoms abate and slight sweating occurs. The tempera-

ture usually drops to 100 degrees F., the headache disappears and the vomiting ceases; this is followed by a new exacerbation of fever at the end of about twelve hours, generally without the chill; and this hot stage is in turn again followed by the remission. These attacks often last three or four weeks.

Pernicious Malarial Fever.—This is rare in temperate climates and is always associated with the aestivo-autumnal parasite. The principal types are the comatose, algid and haemorrhagic forms.

Comatose.—This usually begins with a severe chill, sometimes, however, the chill is absent. The patient is violently seized with grave cerebral symptoms as acute delirium or sudden coma. The fever is usually high and the skin is hot and dry. The comatose condition lasts from twelve to twenty-four hours when consciousness usually returns, the primary paroxysm rarely proving fatal; but is, however, often followed in a short time by fatal relapse.

Algid.—This variety is characterized by intense prostration and extreme coolness of the surface with the internal temperature high. The gastric symptoms are extreme nausea and vomiting. The pulse is feeble and small; the breathing frequent and shallow. There is intense thirst. The voice is feeble and indistinct. The mind is clear. The urine is suppressed.

In the affection the parasites invade the gastro-intestinal mucosa especially, sometimes forming distinct thrombosis of the smaller vessels.

Haemorrhagic.—Haemorrhages may occur from the mucous membrane in all severe and persistent types of malarial infection; and is an especial frequent symptom of the pernicius or malignant malarial fever. *Malarial haematuria* is an important form. It is rarely accompanied by a chill, but rather there is a chilly feeling, the nose and fin-

gers become cold and the lips blue. Haematuria, but more often hemoglobinuria, is present. The haemorrhage may recur daily, alternate days or at longer intervals and in severe forms it may be continuous with aggravations at irregular intervals.

Malarial Cachexia.—This is a chronic condition which often occurs in cases that have not been properly treated or in persons that live in malarial districts and are constantly exposed to the infection. The two most striking symptoms of this condition are anaemia and an enlarged spleen or "ague cake." There is fever at intervals, but chills rarely occur. The skin is of a dirty yellow color. The spleen is greatly enlarged and the blood is profoundly anaemic. There is debility, frequent sweating, and the hands and feet are cold. The digestion may be deranged and there may be a slight jaundice. Sometimes there is oedema of the feet and even dropsy occurs. Haemorrhages of the various mucous surfaces are common. Paraplegia and orchitis are rare symptoms. These cases usually do well under proper treatment and if the patient can be moved from the malarial district.

Irregular Forms of Malarial Fever.—Malarial neuralgia most frequently involves the supraorbital branch of the trigeminus; also the occipital, the intercostals, sciatic and branchial nerves may be affected. Such forms of malaria are called "masked malaria." In this form there is no fever and as a rule it is very hard to diagnose. In some cases one or more stages in the paroxysm of intermittent fever is omitted; this is especially true with the chill, in which case it is termed "dumb ague." Malarial cachexia is sometimes called "dumb ague" and both are found among the older inhabitants of malarial districts. Persons living in malarial districts are sometimes affected with constipation, headache, loss of appetite, nau-

sea, vomiting and a languid feeling; this is called "latent intermittent fever." Frequently "bilious attacks" are of a malarial origin.

Diagnosis.—This is usually easy. The characteristic stages of the paroxysms, the periodicity, residence in malarial districts and the alterations in the blood will usually remove every doubt as to the diagnosis.

Prognosis.—This is almost always favorable under early and persistent treatment.

Treatment.—Cases of malarial fever present distinct lesions in the vertebrae and ribs corresponding to the vaso-motor nerve supply of the spleen and liver. The most common lesion found is a marked lateral deviation between the ninth and tenth dorsal vertebrae and a consequent downward displacement of the tenth ribs. A disturbance will always be found in the region of the eighth to the eleventh dorsal vertebrae inclusive, or in the corresponding ribs on either side. These lesions undoubtedly weaken the vaso-motor nerves to the spleen and liver; thus permitting a weakness of the system, especially of the blood, in resisting malarial infection. The blood resisting powers are lessened probably on account of the spleen being affected, as it is an elaborating gland of the blood; and the liver's normal action is somewhat dependent upon the action of the spleen; besides, the liver is a secretory and an excretory organ.

The principal osteopathic treatment given in cases of malarial fever is correction of these subdislocations; and thorough treatment to the liver and spleen directly.

During the *chilly stage* thorough treatment of the vaso-motor nerves in the upper cervical, the upper dorsal, the lower dorsal and the lumbar regions is indicated; this treatment is given to equalize the vascular system.

During the *hot stage* the same treatment as in the chilly stage should be given to control the vascular system; be-

sides a thorough treatment of the spleen and liver is necessary. Sponging the body with water will be of some aid in reducing the temperature.

During the *sweat stage* thorough inhibition at the superior cervical ganglion to control the sweat center of the medulla and treatment at the upper dorsal and first lumbar to control auxiliary sweat centers is indicated.

The bowels should be kept active. When in a comatose form and when internal temperature is high, place the patient in a bath and douse him with cold water

A great deal can be done to prevent malarial infection. The vaso-motor condition of the spleen and liver should be thoroughly examined and treatments applied accordingly. It is claimed that exposure after nightfall is more likely to cause malaria than exposure in the day time. Probably the infection enters the system through the respiratory tract and not through the digestive tract.

SMALL POX.

Synonym.—Variola.

Definition.—An acute contagious disease characterized by an eruption which passes through the stages of papule, vesicle, pustule and scab.

Etiology.—The nature of the specific poison is unknown; it is probably the most virulent of all the contagii in its effect upon exposed persons not protected by vaccination. The disease is contagious throughout the entire attack. The poison is conveyed in the secretions, excretions and in the exhalations from the lungs and skin, but mainly in the pustules and dry scabs. The poison probably enters the system by way of the respiratory tract. No age, sex or race are exempt from the disease. Among the uncivilized people small pox spreads with frightful rapidity and is terribly fatal.

Morbid Anatomy.—The essential morbid anatomy is that of the eruption, which consists of an inflammatory cellular infiltration starting in the rete mucosum close to the true skin. The eruption has four successive stages—*papular*, *vesicular*, *pustular* and the *scab*. The center of the papule represents a focus of coagulation necrosis due to the presence of micrococci (Weigert). The vesicle appears at the apex of the papule. During this stage the rete mucosum presents reticuli which contain serum leucocytes and fibrin filaments. If the process does not extend deeper usually healing takes place without a scar; if, however, suppuration extends into the true skin the papilla-scarring results. The reticuli become filled with leucocytes producing the pustules. The pustules usually rupture, sometimes they dry up; in either case scabbing is produced. The pustules are found in the larynx, trachea, bronchial tubes and sometimes, though rarely, in the oesophagus and rectum. The liver is sometimes fatty, and cloudy swelling of the secreting cells of the kidney may occur. The spleen may be hard and firm.

In the haemorrhagic form extravasations occur in the serous and mucous membranes, the connective tissues, the parenchyma of the viscera and sometimes about the nerve sheaths, bone marrow, walls of the blood vessels and into the muscles.

Symptoms.—The *incubation* period varies from seven to twelve or more days. The onset is sudden, with a severe chill or chills, high fever, intense headache, violent muscular pains, particularly in the back, high fever, rapid hard pulse and delirium, which is sometimes violent. The temperature rises rapidly to 103 or 104 degrees F. the first day. During the third day the characteristic eruption appears in red spots first upon the forehead and lips. Each pock passes through the four stages already described. On the

third or fourth day from the onset when the eruption makes its appearance the fever falls and the patient feels comfortable. The serum appears about the fifth or sixth day when a depression it seen in the middle of each vesicle; this umbilication is very characteristic of the disease. When the suppurative stage arrives the fever again returns; this about the eighth day. On the ninth or tenth day the pustule becomes dry and the scabs are formed, being thrown off in two or three days. During this time the fever and the constitutional symptoms subside and convalescence sets in.

In the *discrete form* the pustules are separate and distinct, while in the confluent form the eruption appears about the second day, and the pustules are so close to each other that they coalesce into large patches. The symptoms are of greater severity and there is marked prostration.

Haemorrhagic form.—This is still more severe and occurs in two varieties, the purpura variolosa or black small pox, and variola haemorrhagica pustulosa. In the former the haemorrhagic symptoms appear early. Haemorrhagic rash and haemorrhages from the mucous surfaces occur and death follows in from two to six days, sometimes before the appearance of the eruption. In the latter variety the case progresses like that of ordinary small pox, the blood making its appearance in the pox during the vesicular and pustular stage.

Varioloid.—This is a modified form of small pox, in which the patient has been previously vaccinated or has had one attack of small pox. Each symptom is milder and its course shorter. There is no secondary fever and the rash appears a day later than in the discrete variety.

Complications.—The complications are laryngitis, which may produce a fatal oedema of the glottis, bronchial pneumonia, lobar pneumonia (rarely), pleurisy, parotitis, vomit-

ing, diarrhoea, albuminuria and true nephritis (rarely). Endocarditis, pericarditis, and myocarditis are rarely met with. Boils and abscesses on the skin are frequent during convalescence. Prolonged delirium and sometimes insanity may occur. Neuritis, arthritis, hemiplegia, aphasia, conjunctivitis, iritis, and otitis media may also become complications.

Diagnosis.—As soon as a perfect papule makes its appearance a positive diagnosis can be very readily made. The rash of measles and scarlatina have sometimes been mistaken for the initial rash of small pox.

In *measles* there is early cough and coryza while the pain in the back and legs is not near so severe as in small pox.

In *chicken pox* the rash is more abundant upon the trunk than upon the face. There are slight constitutional disturbances and the symptoms are all milder.

Secondary syphilis will be distinguished by the history, the absence of fever and itching, and the symmetrical distribution of the eruption.

Cerebro-spinal fever and the haemorrhagic form of small pox may be confounded. If the patient has been exposed to small pox or if he has not been vaccinated even if the initial symptoms are those of cerebro-spinal fever the patient more than likely has small pox. The diagnosis can be more positive by the ankles and other joints not being involved, by the irregular temperature curve, by the herpes and by the marked hyperesthesia of cerebro-spinal fever.

Prognosis.—This depends upon the severity of the epidemic, the protection by recent vaccination and the appearance of the eruption. The haemorrhagic form invariably proves fatal. The discrete form is the most favorable. Severe pneumonia and laryngitis are fatal complications.

Treatment.—In all cases of small pox the patient should be isolated; it is best that they be taken to a small pox hos-

pital. The room should be stripped of all unnecessary furnishings, an up-stairs room being best. All communication of the nurses with members of the family should be prohibited. All utensils and clothing of the patient must be carefully disinfected and the room thoroughly ventilated. The nurse should be provided with suitable clothing which is to be removed upon leaving the room. The doorways may be protected by hanging in them a sheet dampened in a solution of carbolic acid, 1:60. The best preventive means of small pox is vaccination. (See vaccination.)

The treatment largely consists of meeting the symptoms as they arise. The pains in the back and limbs are to be controlled by careful treatment of these regions, especially by relaxing the muscles thoroughly. For the fever besides the ordinary treatment cold sponging or the cold bath will be helpful. When the temperature reaches 103 degrees F. with presence of considerable twitchings and delirium the patient should be placed in a bath of 70 degrees F.; this may be repeated every three hours if necessary. Let the patient have plenty of cool drinks.

Treatment of the eruptions should receive careful consideration especially in the prevention of disfigurement. Constant applications of cold water with carbolic acid as an antiseptic is considered good. When the crusts are forming a thorough application of vaseline will allay the burning and itching and prevent the diffusion of the particles of epidermis; which aids in keeping the contagion from spreading through the air. Quite frequent bathing helps to keep the crusts softened. The adding of the carbolic acid, ten grains to the ounce, to the vaseline also aids in preventing the odor.

The eyes, nose, mouth and throat should be carefully watched and the parts kept clean of all crusts. Tracheotomy may be necessary if the obstruction of the larynx becomes extensive. The diarrhoea is best controlled by thorough

treatment of the splanchnics. During convalescence the patient should be bathed daily. When a patient's skin is perfectly smooth the danger from spreading the disease is over.

VACCINATION.

Synonyms.—Vaccina; cow-pox.

Definition.—Vaccina is an eruptive disease of the cow and when the contents of the vesicle of cow-pox is introduced into the blood of man, it produces a local manifestation, the vaccine vesicle, with constitutional disturbance, and the majority of persons, thus successfully vaccinated, are protected from small pox.

The vaccine is usually taken directly from the cow (animal lymph), although it is obtained from persons vaccinated (humanized lymph) as well, but this is not as successfully used as there is danger of communicating other affections, particularly syphilis.

Period of Life for Vaccination.—The vaccination should be made about the third month but if small pox is not prevalent it is best to wait until the end of the second year. The second vaccination should be made about the seventh year and a third at puberty. After puberty they should be vaccinated every few years and always when small pox is prevalent.

The Performance of Vaccination.—The favorite situation for inoculation is on the arm over the insertion of the deltoid muscle. In girls it is sometimes preferred on the leg, the point usually chosen is over the junction of the two heads of the gastrocnemius muscle.

The part chosen should be rendered aseptic and the skin scratched with a lancet or with the ivory point, until serum begins to exude. If blood should be drawn it should be carefully dried before the lymph is applied, as it interferes

with absorption. The moistened virus should then be carefully rubbed over the abraded surface. The spot must be carefully protected until thoroughly dry.

Symptoms.—About the third day a small red papule appears. On the fifth or sixth day a definite vesicle and by the eighth day it has attained its full size. It is filled with a limpid fluid, is umbilicated and the surrounding tissues are red, tender, swollen, and infiltrated. About the twelfth day the pustule dries up and forms a scab which separates during the third or fourth week, leaving a permanent cicatrix. If the vaccination is made on the arm the axillary glands are often swollen and tender; if on the leg, the inguinal glands are affected.

Complications.—Sometimes additional vesicles are formed near the point of inoculation. Sometimes vesicular eruptions may occur. Erysipelas, various cutaneous eruptions and in a few instances tetanus are complications which may arise. Syphilis has occasionally been transmitted as has already been stated through humanized lymph. As the result of uncleanliness or owing to injury the vesicles inflame and ulcers form.

SCARLET FEVER.

Synonym.—Scarlet rash, scarlatina.

Definition.—An acute infectious disease characterized by high fever, sore throat, angina, rapid pulse and a diffuse scarlet eruption followed by a membranous desquamation. There is an unusual tendency to nephritis.

Etiology.—The specific poison that causes scarlet fever has not yet been isolated. In no disease is the contagion so tenacious; it may be conveyed by infected bedding, clothes, etc., for a year or more after the case has occurred. It is most frequent in children before the age of ten; adults are not exempt. One attack does not always give im-

munity; a second and a third have occurred. Both sexes are alike susceptible. Epidemics occur at all seasons of the year; they are, however, of greater intensity during the autumn than in winter. The disease is not communicable until a desquamation takes place; hence persons kept away from the disease at this period generally escape it. It is very hard to disinfect an apartment after a case of scarlet fever. The disease has been communicated to new occupants even after the room has been thoroughly cleansed. The contagion has been carried in milk. The streptococcus pyogenes have been found in the blood, the skin, and the organs after death.

Morbid Anatomy.—There are no morbid changes, and except in the haemorrhagic form the eruption fades after death. The throat is inflamed and sometimes ulcerated. The morbid changes found in the other organs are those of the complications which may arise.

Symptoms.—The period of incubation varies from twenty-four hours to twelve days; it is usually two or three days.

Invasion. The onset is usually sudden, with vomiting and sometimes convulsions, and the tongue is furred. The pulse is rapid and hard (140 to 150). The temperature rises rapidly to 104 or 105 degrees F. The skin is dry, the face is flushed and there is sore throat.

The Eruption. This appears usually on the second day, first upon the neck, then the chest and rapidly spreads over the entire body. When examined closely it is seen to consist of a multitude of red points corresponding to the hair follicles; at a distance this gives the entire body a bright scarlet color. It disappears upon pressure, but returns as soon as the pressure is removed. The rash may be uniform or it may occur in discrete patches. The eruption does not always appear on the face.

In some cases the eruption is pale and hardly visible, or

it may be papular or vesicular (scarlatina miliaris) and occasionally petechial.

There is itching which may be moderate or intense. The rash persists for two or three days and then gradually fades and is soon followed by a scaly desquamation.

Febrile symptoms. The fever rises abruptly to 104 or 105 degrees F. and remains high. The pulse is hard, quick and out of proportion to the fever; it varies from 140 to 160. The duration of the fever is from seven to nine days, after which it falls by lysis. The respirations are hurried; there is loss of appetite and the bowels are constipated. The gastro-intestinal symptoms are not marked after the initial vomiting. The urine is scanty, thick and high-colored, and it contains urates and a small amount of albumin.

Nervous symptoms. Sleeplessness, mild delirium, headache, insomnia, and rarely convulsions, may occur during the attack.

The tongue is red at the edges and tip and furred at the center, with enlarged fungiform papillae and known as the "strawberry tongue." In a few days the dead epithelium is cast off leaving the tongue red and raw looking.

Duration.—In an uncomplicated attack the duration is from three to fourteen days, according to the severity of the disease.

Malignant Scarlet Fever.—*Anginose Variety.* The throat symptoms are severe. The fauces and tonsils are swollen and are often covered with false membrane which may extend forward into the mouth, upward into the nostrils, and may also involve the posterior pharynx, the trachea and bronchi. The throat may present all the symptoms of a severe diphtheria. The fever is high and there is great prostration. The glands of the neck are greatly enlarged. Abscesses and ulceration of the throat occur frequently. Death

may result from ulceration into the carotid artery or it may occur rapidly from toxaemia or exhaustion.

Malignant variety. There may be almost immediate prostration and death may occur within twenty to forty-eight hours, before the appearance of the rash. The onset is abrupt and the symptoms are of great severity. The temperature may rise to 106 or 107 degrees F. or higher with the pulse rapid and feeble. There is delirium which rapidly passes into coma. Convulsions may occur.

Haemorrhagic variety. Haemorrhages may occur into the skin; and there are epistaxis and haemituria. This form occurs most frequently in enfeebled, poorly nourished children. Death may take place in two or three days. Like the preceding form this nearly always proves fatal.

Complications.—*Nephritis.* This develops, as a rule, during convalescence and may occur after a mild attack. The urine should be examined daily; some cases are ushered in by suppression of the urine, by uremia or by dropsy. Sudden death may occur during the course of the nephritis.

Arthritis, synovitis, rheumatism, pyemia, otitis, adenitis endocarditis, pericarditis and pleurisy, and nervous complications such as chorea, convulsions, hemiplegia and progressive paralysis may occur.

Diagnosis.—This is not difficult, although for a time it may be confounded with the following diseases:

Acute exfoliating dermatitis. The throat symptoms are usually absent. The tongue is not characteristic of scarlet fever. The onset is sudden with fever only. The desquamation begins before the rash is entirely gone. Nephritis is not a common complication and relapses are common.

Measles. The sore throat is less marked, the eruption occurs later, and is of a very different character from that of scarlet fever. The pulse is in proportion to the fever; and leucocytosis is absent.

Diphtheria. The cutaneous rash is usually absent. The false membrane is always present, containing the Klebs-Loffler bacillus; the tongue has not the strawberry appearance.

Drug rashes. These rashes follow the use of quinine, belladonna, potassium, bromide and chloral. There is no fever, no characteristic symptoms of invasion and the rash is of short duration.

Prognosis.—This varies greatly. The prognosis should always be guarded.

Treatment.—The treatment of scarlet fever consists of careful nursing and disinfection, watching for complications and treatment of the symptoms as they arise. The patient should be isolated and there remain until desquamation is complete. The room given the patient should be an upper one if possible. The room should be stripped of all unnecessary furnishings and a competent nurse put in charge. All unnecessary communication with members of the family must be entirely prohibited. The temperature of the room requires to be kept as uniform as possible, with proper ventilation. The diet should consist of milk, light broths, egg albumin and fruit juices, and plenty of water.

Thorough osteopathic treatment is to be given along the spinal region to keep the muscles thoroughly relaxed and give special attention to the renal splanchnics and to the cervical vertebrae. The neck should be watched most carefully for any abnormalities that may occur to the cervical vertebrae, and the cervical muscles kept as well relaxed as possible. Particular attention must be given the deep cervical muscles, especially those beneath the angles of the inferior maxillary and those between the atlas and occiput; keeping these deep cervical muscles in normal condition will help very greatly in preventing complications that may arise in the ears, besides greatly relieving the severe symp-

toms of the naso-pharyngeal region. By attending carefully to the intestinal and renal splanchnics any disturbance of the intestinal tract can generally be kept under control and the liability of renal complications are greatly lessened. Direct treatment to the abdomen should be practiced during each visit to keep the bowels, kidneys and liver active.

In cases of heart enfeeblement attention to the cervical sympathetic and quite vigorous treatment through the upper left dorsal region are indicated. The most effective fever treatment will be in keeping the emunctories active, though spinal treatment and an inhibitory treatment of the sub-occipitals will be of great aid. The tension of the ear drum must be watched constantly; and if severe inflammation of the ear should arise that cannot be relieved by the upper cervical treatment, which consists of correcting any deviation of the atlas and relaxing the deep muscles at the angle of the inferior maxillary and relieving impingements of vaso-motor nerves to the ear at the upper dorsal, then perforation should be performed.

In the treatment of the eruption, which is due to a hyperaemic condition of the cutaneous vessels followed by oedema; using carbolized water 1:40 to sponge the surface, followed by the application of cocoa butter will tend to reduce the fever by soothing the cutaneous burning and irritation; and later on when desquamation occurs it limits the source of infection by preventing the diffusion of what would be dry scales in the air; and finally it protects the surface from the influences of sudden changes of temperature, thus to a great extent avoiding the danger of nephritis.

Bathing the patient three or four times a day with tepid water is of great aid in relieving the fever, besides preventing complications. The gradually cooled bath will be of aid when there is high temperature and marked nervous symptoms, besides increasing cardiac action. Cold water

applications to the exterior of the throat will be gratefully received by the patient; pellets of ice in the mouth will also be of some comfort. Continued bathing several times a day aids the kidneys greatly by vicariously eliminating the poison generated in the system. The physician should take pains to disinfect himself. A linen duster after being dipped in a solution of bichlorid and dried, worn during his visit to the room of the patient, will be quite sufficient.

RUBELLA.

Synonyms.—Rötheln; rubeola notha; German measles; French measles; false measles; epidemic roseola.

Definition.—An acute contagious disease resembling both scarlet fever and measles; characterized by no prodromal stage, slight fever, coryza, slight sore throat, mild catarrhal symptoms (rarely), a punctiform rash, and is free from sequelae.

Etiology.—It generally occurs in epidemic form, but sporadic cases are not uncommon. It is much less contagious than either measles or scarlet fever. It especially affects children, rarely adults, and spreads with great rapidity.

Symptoms.—These are usually mild and it is a much less serious disease than measles.

The incubation stage is from two to three weeks. The disease begins with drowsiness, slight fever, sore throat, chilliness and pains in different parts of the body. The rash appears on the first or second day on the face, first, and rapidly extends over the entire body. It consists of red, oval, slightly raised spots. This lasts for a couple of days and terminates in a slight branny desquamation. The lymphatic glands of the neck are often swollen, especially the superficial cervical and posterior auricular glands.

Duration.—It rarely lasts more than from three to five days.

Prognosis.—The prognosis is good. Complications are rare. If the surroundings are unhygienic, or if the child is delicate, it is more serious. Pneumonia, severe bronchitis and gastro-intestinal catarrh may occur and prove fatal. Relapses are quite common.

Treatment.—Rest in bed is the principal treatment, although the case should be watched on account of complications. See that the bowels are kept open and the diet is restricted for a few days. It would be well to have the attendant sponge the surface of the skin once a day with water, and apply vaseline locally for the itching. If the fever is high give the ordinary fever treatment.

CHICKEN POX.

Synonym.—Varicella.

Definition.—An acute contagious disease, characterized by slight fever, mild constitutional symptoms and by an eruption of vesicles on the skin.

It occurs most frequently in epidemic form, although sporadic cases are met with. The disease is highly contagious; the specific organism, however, has not yet been discovered. It is a disease of childhood and is seldom seen in adults. The greater number of cases occur between the ages of two and six. Chicken pox and small pox are distinct and separate diseases; an attack of one does not protect from the other.

Symptoms.—The incubation period is from ten to fifteen days. In many cases the eruption is the first symptom, in others there may be restlessness, slight fever and general indisposition. Still in other cases there is a slight chill with feverishness or there may be vomiting with muscular pains in the back and legs. The eruption appears within twenty-four hours in the form of small reddish puncta appearing first upon the trunk. In a few hours they become pearly

pustules, rarely umbilicated and contain a clear or turbid fluid. By the end of the third day they begin to dry up, crusts then form which drop off and, as a rule, leaving no scar. The eruption appears in crops so that about the fourth day one can usually see pocks in all stages. There may be excessive irritation of the rash and if the pocks are scratched by the child, scars may be left after healing.

Complications.—Erysipelas, gangrene about the vesicles, haemorrhagic pox with haemorrhages from the mucous membranes, nephritis, infantile paralysis, and it is quite frequently complicated with measles and scarlet fever. As a general rule complications seldom arise.

Diagnosis.—This is, as a rule, easy. The eruption comes out slowly and in crops. There are slight constitutional disturbances and the abundance of the rash upon the trunk will distinguish varicella from small pox.

Prognosis.—This is invariably favorable.

Treatment.—The child should be isolated until the crusts fall off, for as long as the crusts are present the disease may be transmitted. Usually there is no special treatment, as the constitutional symptoms are so mild. Simply have the child go to bed for a few days and by sponging daily with tepid water and the use of vaseline locally to prevent itching, will be quite sufficient. A light general treatment may be given as it generally makes the child feel more comfortable, besides it prevents complications.

MEASLES.

Synonym.—Rubeola morbilli.

Definition.—An acute contageous disease characterized by an initial coryza, nasal and bronchial catarrhal symptoms, a rapidly spreading eruption and moderate fever.

Etiology.—It is essentially an epidemic disease, yet now and then sporadic cases occur. The disease is in all proba-

bility due to a micro-organism, but as yet none have been isolated. One attack does not always protect from another. It occurs at all seasons, but epidemics occur most frequently during the fall and winter. Children are more susceptible, but unprotected adults are very liable to be attacked. The contagion-bearer is not definitely known, but it is likely to be the nasal and bronchial discharges and by the breath.

Morbid Anatomy.—There is no essential morbid anatomy in uncomplicated cases. Fatal cases show, as a rule, capillary bronchitis, catarrhal pneumonia, pulmonary collapse and acute nephritis. The lesions of intestinal catarrh are rarely found. Measles itself very rarely kills.

Symptoms.—The period of incubation varies from seven to fourteen days.

Prodromes.—Sneezing, fretfulness, chilliness, coryza, watering of the eyes, feverishness, cough and drowsiness.

The disease generally sets in with symptoms of a cold with some fever. There is marked coryza, watery eyes, sneezing, photophobia and a dry, croupy cough. The temperature rises to 103 or 104 degrees F. The tongue is usually furred. The early catarrhal symptoms are more marked than in any of the other infectious diseases.

The eruption appears about the fourth day, when the fever and general symptoms have reached their height. It first appears upon the face, rapidly spreading over the whole body. It is composed of small, dark red papules at times arranged in small crescents. This lasts for two or three days, when it begins to fade and branny desquamation soon follows. The catarrhal symptoms gradually disappear and convalescence is rapid. If the fever continues high after the rash is out, there is apt to be some complication, as severe bronchitis, pneumonia or acute nephritis.

Malignant or Haemorrhagic Measles.—This form occurs particularly when the hygienic surroundings are bad. The

disease sets in with much greater intensity and is characterized by a petechial rash, by haemorrhages from the mucous membrane and great constitutional depression. This is a very serious form and death generally occurs early.

Complications.—Bronchitis, broncho-pneumonia, lobar-pneumonia (rarely), catarrhal or membranous meningitis, ophthalmia, cancrum oris, otitis, intestinal catarrh and nephritis (rarely).

Sequelae.—Tuberculosis, paralysis and diarrhoea.

Diagnosis.—*Scarlet fever.*—In this there is longer initial stage with characteristic symptoms, sore throat, fever is high and the pulse is out of proportion to the fever and there is a diffuse punctiform rash. Upon reappearance of measly redness, after the removal of a finger over the rash the redness appears from the middle toward the periphery, while scarlet fever redness reappears from the periphery toward the center.

Rotheln.—This is characterized by short prodromal stage, slight fever and catarrh, marked sore throat, there is more uniform distribution of the rash which does not assume a crescentric arrangement.

Prognosis.—Uncomplicated measles rarely proves fatal, but the pulmonary complications that may arise make this one of the most serious diseases of children.

Treatment.—Cases of measles should not be attended to carelessly, as is oftentimes done, but care should be taken that the patient is properly protected from atmospherical changes and is carefully nursed and dieted. Physicians many times are careless with cases of measles and severe complications or sequelae arise.

It is best to have the patient isolated and placed in a darkened, thoroughly ventilated room of equal temperature, about 65 degrees F. The case can be controlled easily and safely by competent osteopathic treatment. The treatment

is largely symptomatic and the disease being self-limited, its duration can not be shortened. Carefully protect the organs most likely to be affected. The eyes, ears, nose and throat should be carefully watched. In mild cases simply regulating the diet and bowels and cool sponging, in addition to the fever treatment is all that is necessary.

In severe cases thorough treatment along the spinal column in keeping the muscles relaxed is a very great aid. Especially should the cervical and upper dorsal muscles be carefully relaxed so as to reduce the catarrhal involvements of the respiratory tract, besides preventing complications of the chest and regions of the head. In all cases special attention should be paid to the bowels and kidneys, and the skin should be bathed daily with warm water until desquamation occurs. For the bronchial cough thorough treatment of the anterior and posterior thoracic region is quite sufficient. The muscles should be relaxed well and sub-luxations of the upper ribs should be looked for, as they are oftentimes the cause of the cough. For the irritated skin, warm baths are indicated, besides careful treatment at the atlas and axis for the upper part of the body and at the fifth lumbar for the lower part of the body; and vaseline is a useful adjunct. In cases where the eruption is suppressed, giving the patient a thorough sweat will generally bring out the eruption.

I have always found that measles, treated osteopathically, recover much more rapidly than when treated with drugs. After convalescence has been established, the patient is practically well and able to go out doors, whereas those cases which are treated with drugs require a longer time to regain their strength after convalescence.

MUMPS.

Synonym.—Epidemic parotitis.

Definition.—An acute infectious disease, characterized by inflammation of the parotid gland, sometimes of the submaxillary gland. The testes in males and the mammae and ovaries in females, are sometimes involved.

Etiology.—The disease, no doubt, is of microbic origin, but the nature of the virus is not yet known. It occurs sporadically and epidemically. The disease is most frequently seen in children and adolescents and during the spring and fall. More boys are attacked than girls. Very young infants and adults are seldom attacked. One attack usually gives immunity from a second.

Morbid Anatomy.—There is an inflammatory infiltration of the parotid glands, but there is no suppuration. The salivary gland is swollen and hardened.

Symptoms.—The incubation period is from one to two weeks. The disease is ushered in by a moderate fever, 101 to 104 degrees F., chilliness and malaise. There is pain just below and in front of the ear, but sometimes the first pain is experienced in swallowing. A pyriform swelling is then noticed, which increases rapidly until within forty-eight hours, the neck and side of the cheek are greatly enlarged. This swelling persists for nine or ten days, then gradually subsides and convalescence is rapid. Relapses rarely, if ever, occur. Ringing in the ears, earache and affected hearing commonly occurs. In severe cases the nervous system may be affected, causing headache, fever, delirium, great prostration, or even a low typhoid state may be present.

Duration.—The duration is from six to ten days; the swelling then subsides and is entirely gone by the tenth or twelfth day.

Complications.—The most frequent complication is orchitis, which usually occurs after the inflammation of the

salivary glands has subsided. One or both testicles may be involved. The organs become heavy and painful, inflammation lasting for three or four days and subside gradually. Atrophy has occurred, but this is extremely rare. Mastitis, ovaritis and vulvo-vaginitis sometimes occurs in girls. Meningitis, facial paralysis, convulsions, albuminuria, arthritis, acute uraemia and endocarditis are complications that have occurred. Lesions of the auditory nerve resulting in more or less deafness, which may be permanent, sometimes occurs. Otitis media and in rare cases affections of the eye have been observed.

Diagnosis.—This is usually easy, as the nature and position of the swelling are quite characteristic.

Prognosis.—The prognosis is favorable, uncomplicated cases never prove fatal.

Treatment.—Consists in keeping the patient warm and well protected. The patient should be confined to the bed if the case is severe. Hot or cold applications, usually hot is preferable, to the swollen glands, will be very comforting to the patient. The cervical region should be carefully treated. Relax all the contracted muscles found, particularly the deep muscles and give attention to the correcting of any vertebrae that may be deranged. The atlas and axis are very apt to be found sub-dislocated. In a few cases the upper ribs will be found disordered, probably interfering with either the vaso-motor nerves, or the lymphatics to the region involved. A relaxing treatment around the swollen glands will usually give considerable relief, especially of the deep muscles at the angle of the inferior maxillary. Treat the fever by the usual method and keep the excretory organs active. Probably lesions to the atlas and axis are the predisposing causes of mumps. Secretory fibres of the submaxillary gland are from the second and third dorsals.

WHOOPING COUGH.

Synonym.—Pertussis.

Definition.—A highly contagious disease characterized by convulsive cough, accompanied by long-drawn inspiration, during which the "whoop" is produced.

Etiology.—The disease occurs in epidemic form, occasionally, however, sporadic cases are met with. It attacks children of all ages and is directly contagious from person to person. It sometimes attacks older persons, in which cases it becomes a serious affection. Usually one attack protects from another. Epidemics last for a couple of months, usually during the spring and winter, and often precede or follow those of scarlet fever and measles. Delicate children and those suffering with nasal or bronchial catarrh, are more subject to the disease than others. The contagion enters the system most probably through the respiratory tract. No special micro-organism has yet been found as the exciting cause of whooping-cough.

Lesions are found of either the pneumogastric, phrenic, sympathetic or recurrent laryngeal nerves. From examination of patients suffering from whooping cough, one is led to believe that the disease is of neurotic origin. Just how a nervous lesion produces the disease I am unable to state. Possibly a disturbance of the vaso-motor nerves to the respiratory tract causes enlargement of the tracheal and bronchial glands, which produce pressure upon terminal filaments of the pneumogastric nerve. Pressure of glands upon these fibres has been suggested by Eustace Smith. Disturbances are found in the middle and lower cervical vertebrae and first, second and third ribs. The vagi, phrenic, sympathetic or recurrent laryngeal nerves may be involved in this region.

Morbid Anatomy.—There are no morbid changes characteristic of whooping cough. In fatal cases complications as

bronchitis, broncho-pneumonia, collapse of the lungs, vesicular and interstitial emphysema are usually present. The tracheal and bronchial glands are enlarged.

Symptoms.—The incubation period is from seven to ten days. At first the symptoms are slight, being those of an ordinary cold, slight cough, some fever and no expectoration. This catarrhal stage lasts about a week or ten days, and is followed by the paroxysmal stage, which begins when the cough becomes more frequent and severe, and the characteristic "whoop" is recognized. The features are swollen and dusky, the skin livid and the eyes are injected. The paroxysm begins with a succession of short expiratory coughs which increase in intensity; there is then a deep inspiration, the air is drawn into the lungs, producing the "whoop." Several coughing fits may succeed each other, until a quantity of stringy mucus is expectorated and vomiting is produced. Food is ejected and in most cases a little blood. An ulcer under the tongue commonly forms. Rupture of a conjunctival or nasal blood vessel sometimes happens. The urine is of high specific gravity, pale yellow and contains much uric acid. The duration of the paroxysmal stage in cases of ordinary severity is usually from four to six weeks. The convalescence period usually lasts four weeks so the entire duration of an ordinary attack is from ten to twelve weeks unless treated in the early stage and aborted.

Complications.—These are generally numerous in severe cases. Haemorrhages are apt to occur in the form of petechiae especially about the forehead; epistaxis, haemoptysis, ecchymosis of the conjunctive, bronchial pneumonia, pleurisy, pericarditis, laryngitis, bronchitis, collapse of the lungs and interstitial emphysema may occur as complications. Sudden death has been caused by subdural haemorrhage.

Sequelae.—Acute nephritis frequently occurs. All the viscera may undergo fatty degeneration which may eventually become a secondary tuberculosis. Permanent changes in the shape of the chest frequently occur.

Diagnosis.—This is easily made as soon as the distinctive "whoop" is heard and a positive diagnosis can not be made without it.

Prognosis.—When the many complications that may arise are taken into consideration whooping cough must be regarded as a very fatal affection; nevertheless many cases recover. The younger the child the greater the danger. The deaths occur chiefly among the children of the poor and in delicate infants.

Treatment.—In the beginning of the disease one may be able to cut the disease short; but after it has fully established itself the disease must run its course, although the severity of the attack and liability of complications can be greatly lessened. The cervical and upper dorsal regions should be carefully examined, also the upper ribs. The disease is caused most probably by deranged vaso-motor innervation to the mucosa of the respiratory tract. Special attention should be paid the vagi and phrenic nerves. Lesions to the recurrent laryngeal nerves are apt to occur from subluxations of the first or second ribs. Lesions to the vagi are usually due to a disordered atlas or axis. Irritations of branches of the vagi will produce the spasm of the glottis, and also a relaxation of the diaphragm. Lesions to the phrenic are usually found at the third, fourth and fifth cervicals.

When cyanotic symptoms arise owing to the impeded respiration and interference with the heart actions, stimulate the heart's action and relieve the obstructed respiration by raising the upper ribs especially those over the heart.

On the whole treatment of the entire respiratory tract is

demanded and thorough correction of the vertebrae and ribs and relaxations of the muscles should be given. As in many diseases only an outlined region can be given wherein one will find the lesion. Attention should be paid the diet for a few days; and the child should be warmly clad. Do not neglect a case of whooping cough as serious complications and sequelae are liable to occur.

INFLUENZA.

Synonyms.—La grippe; epidemic catarrhal fever.

Definition.—An acute infectious disease caused by the bacillus of Pfeiffer; characterized by great prostration, catarrh of the respiratory and digestive tracts and by muscular pains. Serious complications are liable to occur especially pneumonia. It generally occurs in an epidemic form.

Etiology.—The disease is highly contagious. That it is of microbic origin, the bacillus of Pfeiffer can no longer be doubted. The origin of the bacillus has not yet been settled. The disease is probably only communicated by contagion spreading rapidly along lines of travel. The contagion most probably enters the system by way of the respiratory tract.

Morbid Anatomy.—No special anatomical lesions have been found, as uncomplicated cases recover. The lesions therefore are those of the complication. The complications are very varied. Pneumonia (lobar and lobular) pleurisy, endocarditis, severe bronchitis and nephritis may exist. They may either be the result of the action of the toxin or the bacillus may be carried in the blood, locate in a weakened portion of the body and thus cause the secondary infection.

Symptoms.—The incubation period is from two to four days, sometimes longer. The onset is usually sudden with a chill or continued chilliness. Sometimes there is a severe

rigor; the temperature rises suddenly to 104 or 105 degrees F. Headache, pain in the back and ribs, great prostration, and cardiac weakness out of all proportion to the intensity of the fever occurs. Mental depression, restlessness, insomnia, and frequently delirium are among the nervous symptoms. In many cases there is coryza, sneezing and watering of the eyes as the first symptoms. Cough and copious expectoration soon follow these symptoms. Gastro-intestinal symptoms may be marked. Nausea and severe vomiting may usher in the attack, adding greatly to the general weakness. The pulse is feeble, small and frequently intermittent. Dyspnoea may be a marked symptom. Widely different symptoms are presented by different cases; the same is true of the different epidemics.

Complications.—The most serious and fatal complication is pneumonia. Endocarditis and pericarditis are rare complications. Death may result directly from heart failure. Pulmonary catarrh is common; while many cases present severe bronchitis. Latent diseases are often developed into acute diseases during an attack of influenza and slight organic lesions often become serious sequelae.

Sequelae.—The sequelae are chronic gastro-intestinal catarrh, phthisis, chronic bronchitis and rarely abscess or gangrene of the lungs. Persistent headache, neuralgia, neuritis, insomnia, melancholia, mania, meningitis and locomotor ataxia are some of the nervous sequelae.

Diagnosis.—In epidemic form the disease is easily diagnosed. Isolated cases are often mistaken for a "bad cold." Fever of short duration, marked prostration and the muscular pain are the diagnostic symptoms. The duration is usually from four to seven days. Convalescence is protracted. One attack predisposes to a second and relapses are frequent.

Prognosis.—This is favorable if the patient goes to bed or at least keeps to the house. Fatal cases are due to complications as a general rule.

Treatment.—The osteopathic treatment in all cases is simple but effective. Rest in bed, attention to the regions involved by appropriate treatment, careful hygienic management and a light diet will meet the requirements. The osteopathic treatment required varies with the nature of the attack and consequently a definite method of treatment cannot be given. The case is to be treated by the same method as when the various affected organs are involved in like manner under other circumstances. The fever is treated in the usual way. The pain, aching and tired feeling of the patient are best relieved by careful treatment of the entire spine and by relaxation of contracted muscles. Great relief is experienced by the patient when the muscles of the legs are stretched and the internal and external rotary movements are executed. The patient should be kept in bed until the fever subsides. The general nervous system, the heart and the functional activity of respiration should be carefully watched. During the entire course of the disease the bowels should be kept open. This is best performed by treatment to the splanchnic nerves, and to the liver, bile ducts and intestines directly.

The patient is to be protected from changes in the weather, particularly those who are at either extreme of life and who are weakened by chronic organic disease. The various complications are to be treated as when they are simple diseases. Cooling drinks should be used. Such food as milk, vegetables, gruels, eggs, etc., are to be given.

Insist upon disinfection of the catarrhal discharges, chiefly the bronchial which usually contain the bacilli of Pfeiffer. Isolate the patient when convenient and obtain pleasant surroundings if possible.

DENGUE.

Synonyms.—Break-bone fever; dandy fever.

Definition.—An acute infectious disease; characterized by a double febrile paroxysm, severe pains in the muscles and joints and sometimes a skin eruption.

Etiology.—It is a disease of tropical and subtropical regions. The disease spreads from place to place along lines of travel, attacking both sexes, and all ages. It occurs in epidemics practically affecting every one. No morbid anatomical observations have been made. The disease rarely proves fatal.

Symptoms.—The incubation period lasts about four days. The onset is abrupt with a slight chill, headache, and extreme pain in the joints and muscles of a boring or breaking character. The joints become red, swollen, and painful. The fever rises gradually to 103 or 106 degrees F. or over. The pulse is rapid and full and the respirations are much quickened. The face is flushed, the tongue coated, the appetite is lost, and slight nausea occurs. "Black vomit," similar to that of yellow fever has been observed in this disease. Haemorrhages from various organs may occur and the lymphatic glands are swollen. The urine is scanty and the bowels constipated. Febrile albuminuria and delirium are rare.

At the end of two or three days the temperature falls and then there is a period of remission; the patient is free from pain but profoundly prostrated. During this time the eruption generally appears but is never constant in character. After a remission of two or three days the symptoms reappear and a second febrile paroxysm sets in. This is usually milder and shorter than the first, lasting two or three days, when convalescence begins.

Duration.—This is from seven to ten days. Convalescence is slow and relapses may occur.

Complications.—These are rare. Insomnia, delirium, meningitis (rarely), convulsions in children, and catarrhal inflammations have been met with.

Diagnosis.—The prevalence of an epidemic attacks all classes alike, and the distinct remission renders the diagnosis comparatively easy. An isolated case might be mistaken for acute rheumatism, but the absence of any glandular swelling or eruption, while the pain is more closely limited to the joints will aid in the diagnosis.

Treatment.—The indications of the treatment are to maintain the patient's strength and to treat the leading symptoms as they arise. The severity of attack can probably be lessened at the start by strong and thorough treatment of the sub-occipital, upper dorsal, lower dorsal and lower lumbar regions respectively, so as to control the large vascular areas by means of the vaso-motor nerves of the cranial region, the vascular area to the lungs, the splanchnic region and circulation to the lower limbs, thus equalizing the entire vascular system.

The high fever may be treated by the usual methods and by the external application of cold water. The pain is to be controlled according to the region affected by a correction of parts impinging upon the nerve tissues and by strong inhibition. The entire spinal region should be kept constantly in a relaxed condition as far as muscular contractions are concerned. Particularly should the treatment be extensive along the spine during prostration. During the entire attack of the disease the patient should be kept in bed and a carefully regulated diet administered. A suitable change of air may hasten convalescence.

CEREBRO-SPINAL MENINGITIS.

Synonyms.—Spotted fever; cerebro spinal fever; petechial fever.

Definition.—A specific infectious disease caused most probably by the micrococcus lanceolatus, occurring sporadically and in epidemics. It is characterized by inflammation of the membranes of the brain and spinal cord and a clinical course of great irregularity.

Etiology.—The specific cause of cerebro-spinal meningitis is believed to be a micro-organism, the micrococcus lanceolatus. Lesions are frequently found in the vertebrae corresponding to the cervical and dorsal enlargement of the cord. The disease is not directly contagious. More commonly it attacks the young, although it may occur at any age. Over exertion, prolonged marching in the heat, over crowded and illy-ventilated buildings, barracks, tenements, and depressing mental influences are predisposing causes. Many times the disease occurs among the poorer classes. Sometimes the disease prevails in the country rather than in the city.

Morbid Anatomy.—In cases that prove speedily fatal there may be no characteristic changes. Other cases in which death occurs after the disease has been fully developed there is found every degree of inflammation from slight hyperaemia to suppurative changes. The arteries, veins and sinuses are greatly engorged. The walls of the ventricles may soften and the ventricles contain serous exudate. The brain matter may be congested and softened in spots. In the spinal membranes similar changes take place and at times there is extravasation of blood. The changes are more marked on the posterior than the anterior surface of the cord. Abscesses sometimes form. The exudate may follow the lymph sheaths of the cranial

nerves, especially the auditory and optic. In long standing cases the membranes become thick and adherent and areas of softening or atrophy of the cortex develop.

The spleen may be normal in size but when the fever has been intense it may be slightly enlarged. Bronchitis, pneumonia, endocarditis and pleurisy may occur. The liver may become hyperaemic and the kidneys congested.

Symptoms.—*Ordinary form.*—The onset is sudden with a decided chill, headache, vomiting and pain in the neck and back, which is usually severe but may be so slight as not to be noticed by the patient. The temperature rises to 101 or 102 degrees F. The pulse is full and strong. Hyperaesthesia is a prominent symptom. The muscles of the neck and back become rigid. Convulsions are common in children; there may be paralysis, especially of the muscles of the face and eyes. Delirium usually appears early, it may be mild but it is often maniacal. The bowels are usually confined, though there may be diarrhoea. There is leucocytosis; jaundice has been met with.

The urine is sometimes albuminous and sugar has been noted in rare cases. The urine may be increased but more often it is lessened as in other infectious diseases.

The cutaneous symptoms are important. Herpes facialis occurs shortly after the onset in more than half the cases. The contents of the vesicles may be purulent and one or two may coalesce. The petechial eruption may be numerous and cover the entire skin; they do not disappear upon pressure and the number of spots vary greatly. Other eruptions as sudamina, ecthyma, pemphigus, urticaria, erysipelas, rose colored spots, and gangrene of the skin (rarely) have been met with.

Malignant form.—The onset is sudden, usually with violent chills, headache, depression, and in a few hours coma and collapse which is soon followed by a fatal termination.

The temperature may rise slightly but it is often subnormal. The pulse is feeble; breathing is labored. These cases occur more frequently at the beginning of an epidemic. They may occur sporadically.

The *abortive form* terminates abruptly after the development of one or more pronounced characteristic symptoms.

The *mild form* can only be recognized during the prevalence of an epidemic. The symptoms are very mild, slight vomiting, little or no fever, headache and slight pain in the back and limbs.

The *intermittent form* is characterized by exacerbations in the fever every day or second day. The strict periodicity seen in malaria is not observed; the fever resembles rather that of pyaemia.

Complications.—Pneumonia (lobar and lobular) is a frequent complication. Pleurisy pericarditis, parotitis, arthritis and enteritis are not uncommon.

Sequelae.—Blindness, deafness, keratitis (rarely), persistent headache, chronic hydrocephalus, abcess of the brain, mental feebleness, defective articulation, aphasia, and paralysis of certain cranial nerves or of the lower extremities may occur.

Diagnosis.—*Typhoid fever* begins slowly and is unaccompanied by vomiting, muscular spasms or rigidity, or hyperaesthesia. In typhoid the fever is higher and there is a characteristic temperature curve.

Tubercular meningitis is not epidemic and has no characteristic eruption. It is usually less sudden in its development and is invariably fatal. Retraction of the neck, muscular spasms of the legs and arms are not so marked as in spinal meningitis.

Pneumonia may be complicated with meningitis, especially when the meningitis is confined to the cerebrum. If the case is not seen early it is almost impossible to say

which is the primary affection, as pneumonia may have meningeal complications or cerebro-spinal meningitis may be associated with pneumonia. There will be motor spasms and tremors but the head is rarely retracted, and there is less myalgiac pains than in cerebro-spinal meningitis.

Prognosis.—This varies according to the severity of the type. It is a grave disease; the old and young almost invariably perish. The duration is very variable from two or three days to weeks or even months. Convalescence is very slow and relapses are prone to occur.

Treatment.—The osteopathic treatment of cerebro-spinal meningitis requires a most thorough work along the spinal column, especially the cervical region and the region of the dorsal enlargement of the spinal cord, in relaxing and keeping relaxed the deep muscles on either side of the spine and correcting the derangements of the vertebrae, particularly in the upper cervical spine. Such treatment has a marked effect on the circulation in the spinal cord and brain. Probably, a large amount of our work along the spine in all cases where muscles are relaxed has a direct effect upon the circulation of the spinal cord. This treatment constitutes the primary osteopathic work in cerebro-spinal fever and should be vigorously and continuously applied until a cure is obtained. Even in chronic cases where limbs have been greatly affected by pressure upon the centers of nerves due to a thickened membrane continued osteopathic treatment along the spine has a marked effect in absorbing the pathological condition and restoring strength.

The preceding spinal treatment is also a very great safeguard in keeping the various viscera healthy and thus preventing complications. In all constitutional diseases of an acute nature it is a wise precaution to thoroughly examine

the entire length of the spinal column at each visit; and if such precaution is taken many serious complications will never occur that might otherwise occur if such is not done.

The patient should be isolated in a somewhat darkened room and care taken that the disease is not allowed to spread. The diet should be a nutritious one of milk and broths. Cold to the head and spine will be of service in controlling the inflammation; it should be applied with an ice-cap and a spinal ice-bag. Sponging of the body should be employed if the temperature is above 102 and one-half degrees F. The general bath, as in typhoid fever, may be employed if possible. Direct treatment to the bowels, kidneys, liver and spleen may be given at each treatment; especially to the liver, intestines and kidneys.

DIPHTHERIA.

Synonyms.—Diphtheritis; angi maligna; malignant sore throat; cyanche contagiosa; membranous croup; angina membranacea.

Definition.—An acute contagious disease caused by the Klebs-Loeffler bacillus, and characterized by the formation of a false membrane and by constitutional symptoms. The presence of the Klebs-Loeffler bacillus distinguishes true diphtheria from any other form of membranous inflammation. The term diphtheroid is applied to all such forms as are not due to Klebs-Loeffler bacillus.

Etiology.—The exciting cause is the Klebs-Loeffler bacillus. The predisposing cause is obstruction to the circulation of the pharynx and tonsils by subdislocations of upper cervical vertebrae and severely contracted deep muscles of the neck. The stasis of blood favors the growth of the bacillus. The constitutional symptoms are produced by the toxines generated by the bacillus and absorbed from the

diseased spots by the lymphatics and blood vessels. The bacillus is non-motile and does not penetrate the mucosa but remains very near the site of the local changes. The bacillus is very resistent and can maintain an existence for months outside of the body. There is great variation in the virulence of the Klebs-Loeffler bacillus; it has been found in perfectly healthy throats and sometimes the bacillus may exist in the throat after an attack of diphtheritis for months after all the membrane has disappeared. It has also been found in cases of simple catarrhal angina without membrane and in simple lacunar tonsilitis. Of the bacteria associated with the bacillus of diphtheria the streptococcus pyogenes is the most common and probably the most active, as cases of general infection with this organism have been found in diphtheria. The staphylococcus albus aurens, micrococcus lanceolatus and bacillus coli communis are also found.

Modes of infection.—The contagion is communicated as a rule through the air by means of fomites from the membranous exudate or discharges from the diphtheritic patients or during convalescence from secretions of the nose and throat.

Predisposing causes.—Most cases occur in childhood between the second and seventh year. The disease is most prevalent in the cold autumn and spring months. It is most frequently met with in temperate and cold climates. Defective drainage, catarrhal conditions of the throat, enlarged tonsils, general weakness, and feeble resisting power are predisposing factors. One attack does not confer immunity from another but rather predisposes to a second.

Morbid Anatomy.—The false membrane is usually found on the tonsils, the pillars of the fauces and the pharynx, and in fatal cases it may be very extensive and involve the uvula, the soft palate and the posterior nares. At first this membrane is yellowish white, but later may become gray; it is more or less adherent and when torn off leaves a raw sur-

face. The diphtheritic poison coming in contact with the throat leads to, first, a necrosis or death of the epithelial cells, especially the more superficial and the leucocytes. The second change is the hyaline transformation and simultaneously coagulation; hence the term coagulation-necrosis. The irritation produced by the bacilli causes a migration of leucocytes and these are destroyed and undergo hyaline transformation. This process precedes from without inward and is usually superficial, but the necrosis may be extensive involving the deeper tissues causing ulceration and a gangrenous condition of the parts. The erosion of the tonsils may be deep enough to open the carotid artery. The lymphatic glands are considerably swollen. The spleen is commonly enlarged. The kidneys show parenchymatous changes. The blood is dark and fluid. Fatty degeneration of the heart is not infrequent. Sometimes fibrinous coagula are found in the heart. Capillary bronchitis, catarrhal pneumonia and areas of collapse are almost constantly found on examination of the lungs in fatal cases.

Symptoms.—The *incubation* period varies from two to ten days.

According to the location diphtheria may be divided into pharyngeal, laryngeal and nasal forms.

Pharyngeal Diphtheria.—At first there may be a slight chill or chilliness followed by fever and sore throat both of which increase rapidly. The throat is swollen and red and the child complains of difficult swallowing. The membrane begins on the tonsils in the form of grayish-white patches; it then spreads from the tonsils to the soft palate sometimes covering the uvula. The glands in the neck are swollen and tender. The temperature rises to 103 or 104 degrees F. The pulse is rapid and feeble, ranging from 120 to 140. There is loss of appetite and usually grave constitutional symptoms for a few days. The average duration is from one to two weeks.

Laryngeal Diphtheria—Membranous Croup.—This may be secondary to extension from the fauces or it may be primary. At first there is slight hoarseness and a harsh metallic ringing cough. These symptoms may persist for a day or two when the child suddenly becomes worse; there is marked dyspnoea and the lips and finger tips become livid. The child soon becomes very restless. The temperature may be slightly above normal and the pulse increased in frequency. In favorable cases the dyspnoea is not very urgent and the child probably will only have one or two paroxysms when it will fall asleep and wake in the morning feeling very comfortable. The next night, however, the attack may return with greater severity. In extreme cases death may result from suffocation. In some cases the suffocation may be slower and results from extension of the membrane downward into the bronchi.

Nasal Diphtheria.—This is generally secondary but it may be a primary affection. In many cases no membrane may be found, in others there may be a pseudo-membrane formed in the nose; but there is an entire absence of any constitutional disturbance. The Klebs-Loeffler bacillus is sometimes present in these membranes. Nasal diphtheria is apt to be a very grave type of the disease. The constitutional symptoms are grave—great prostration, high fever, marked glandular swelling, irritating and offensive discharges from the nose, and epistaxis. Inflammation may extend through the tear duct to the conjunctiva.

Diphtheria of Other Parts.—A diphtheritic membrane may grow where the skin has been cut or bruised, but the bacillus cannot live on normal skin. It flourishes on a raw moist surface and membranes may grow on the lips, tongue, vulva, glans penis, and on ulcerative surfaces and wounds. Diphtheria occurs occasionally in the conjunctiva and the external auditory meatus.

Complications and Sequelae.—The complications and sequelae are haemorrhages from the nose and throat, skin rashes, especially diffused erythema, urticaria and sometimes purpura; also capillary bronchitis, pulmonary collapse, catarrhal pneumonia, and gangrene of the lungs. Albuminaria, myocarditis, endocarditis, arthritis, otitis media, and paralysis may occur.

Diagnosis.—The presence of the Klebs-Loeffler bacillus will at once decide the diagnosis of true diphtheria.

Prognosis.—The prognosis should always be guarded. The nasal and laryngeal forms are always grave. The causes of death are involvement of the larynx, septic infection, sudden heart failure, broncho-pneumonia during convalescence, and rarely from uraemia.

Treatment.—The local treatment should be carefully but vigorously given. By proper treatment of the throat the extension of the disease may be prevented. The muscles about the throat especially the deep ones should be thoroughly relaxed and the cervical vertebrae corrected if displaced. The vaso-motor nerves to the blood vessels of the affected region require careful treatment at the superior cervical ganglion; and the cervical lymphatics from the atlas to the first rib should be closely watched. The nerves to control are the vagi, glosso-pharyngeal, spinal accessory, and sympathetic nerves to the pharyngeal plexus; and in cases of nasal diphtheria the fifth nerve has to be carefully treated. An external treatment to the pharynx will have the greatest effect on these nerves. An internal treatment to the nerves of the soft palate will be of considerable service. The parts diseased should be disinfected and kept as clean as possible. Bi-chloride of mercury (1:4000) used as a spray will be found satisfactory, although there are several other disinfectants and germicides that may be used. Pellets of ice in the mouth will be a comfort to the patient. Cold ap-

plied externally will be found best for the adult; heat externally is better for the child.

Every possible means should be used to prevent the disease from spreading. One of the chief dangers of diphtheria is the spread of the disease to the larynx, trachea and bronchi. When the disease has extended to these parts it presents all the symptoms of *true croup*. The deep cervical muscles should be thoroughly relaxed to aid in relieving the passive hyperaemia and with a view of disorganizing the exudate. Attention should be given to the upper ribs as interferences with the vaso-motor nerves of the mucous membrane of the trachea and bronchial tubes usually occur. Direct treatment over the larynx and local treatment to the mouth upon the soft palate will be of aid. A thorough relaxation of all the dorsal muscles even as low as the tenth dorsal should be given. Inhalations of slaked, freshly burnt lime may be useful in loosening the exudation. In desperate cases tracheotomy or intubation of the larynx should be performed.

A constitutional treatment should always be given with a view of preventing the spread of the disease from one organ to another and to prevent complications. The heart's action should be carefully watched throughout the entire course of the disease. Treatment of the spinal cord will guard against paralysis that sometimes follows the venous hyperaemia of the vascular linings and substance of the brain and spinal cord. Attention to the splanchnics and to the abdomen directly will tend to keep the stomach, liver, kidneys, and intestines in a healthy state. The diet of the patient should consist of liquid food—milk broths, meat juice, raw eggs and barley water. Let the patient drink freely of water. Treatment of the patient rectally may be employed when the pharynx is greatly disturbed.

Hygienic and prophylactic measures are important. A

room should be selected that is ventilated and exposed to the sunlight. All unnecessary articles of furniture should be removed. Great care must be taken against the spread of the disease. Always isolate the patient and disinfect everything that has come in contact with the patient. The greatest danger lies in the spread of the disease during convalescence, and in the ambulatory form when patients are about and coming in contact with many individuals, especially children with catarrhal conditions of the nose and throat. The physician should be careful about disinfecting himself.

DYSENTERY.

Synonyms.—Bloody flux; colitis; ulcerative colitis.

Definition.—The term dysentery is applied to any form of inflammation of the large intestines. Usually there is also ulceration.

There are three distinct varieties:

(1) Acute catarrhal or sporadic dysentery.

(2) Amoebic or tropical.

(3) Malignant or diphtheretic.

Any one of these forms may become chronic.

History.—Dysentery is one of the four great epidemic diseases of the world. Its severest forms are found in the tropics where it destroys more lives than cholera. Sporadic cases may occur anywhere and severe epidemics are found in the more northern countries. It has been very fatal to armies and ships' crews, but is gradually becoming less frequent. It is especially frequent in summer and autumn and in malarial localities.

ACUTE CATARRHAL DYSENTERY.

This is the variety most frequently found in temperate climates. It may occur sporadically or endemically. There

is a simple catarrhal inflammation of part or the whole of the large bowel.

Etiology.—Sudden atmospheric changes and simple irritants, such as unripe and indigestible food, are usually the causes. The primary cause of acute catarrhal dysentery is always found by the osteopathist to be due to spinal derangements in the lumbar region. The lesion is generally a slight lateral deviation of a vertebra although the displaced vertebra may be posterior or anterior. It is generally found at the second or third lumbar, though the trouble may be found at any point in the lumbar section. The lesion probably involves vaso-motor nerves to the intestinal mucous membrane, thus causing the inflammation. The drinking of impure water in itself may not be the cause of the disease, but it is a favorable medium for the development of the organisms which may cause it. Dyspeptic conditions and constipation seem to predispose to the disease.

Morbid Anatomy.—The mucous membrane is injected and swollen and often smeared with bloody mucus. The follicles of Lieberkühn are enlarged from retention of their contents, the result of the swelling; the follicles are often ruptured and the mucous membrane sloughs off in patches forming ulcers. These may extend along the whole colon.

Symptoms.—Diarrhoea is the most constant initial symptom, the stools being copious and painless. The stools soon become small, frequent and mucus, and streaked with blood. These are passed with straining and tenesmus accompanied by colicky abdominal pains of a griping character. Chills are rare. The tongue is furred and moist, later it becomes dry. Nausea and vomiting may be present, but not as a rule. There is slight fever, and often excessive thirst. Later the stools become of a green color on account of the bile, which causes a burning sensation in the rectum.

On examination there are found red blood corpuscles and

leucocytes, and large round and oval epithelioid cells containing fat drops and vacuoles. No specific organisms are found, and bacteria are scarce. In mild cases the course is about eight days, severe cases subsiding within four weeks.

Prognosis.—The prognosis is generally favorable when the disease is treated properly. The condition may become chronic.

Treatment.—Invariably a lesion of the spinal column is found at the third and fourth lumbar or near by. It is generally a subluxation of a lateral nature between these vertebrae; rarely is the lesion above or below this point. The treatment should be applied immediately and directly to this region. Time is valuable is these cases and one should go to work at once to correct the irritation. An attempt should be made at each treatment to correct the disorder. This should not be delayed by wasting time in relaxing muscles and inhibiting, as at best this gives only temporary relief. When a slight movement has been accomplished between disordered vertebrae, treatment should be stopped and results watched because the movement may have released all obstructions or irritations causing the disease. Besides in many cases to get an anatomically correct spine is an impossibility from the fact that the displacements may be of long standing and naturally the luxated and subluxated vertebrae have conformed themselves to some extent to their unnatural position. In other words, what has been lost in shape and size of a vertebra may have been gained by reducing the effect of the lesion to a minimum. A lesion of this nature at the third lumbar impairs the innervation to the colon and consequently produces a stasis of blood in the mesenteric circulation, followed by inflammation, bloody discharges, cramps, etc. A single treatment is usually quite sufficient in milder cases. Other cases require treatment every two hours or thereabouts, until cured.

Treatment directly over the abdomen through the mesenteric circulation and glands is an effective treatment in most cases and especially where the attack is severe. It relaxes the tissues about the mesentery, thereby relieving the stasis and freeing the circulation.

The constant desire to defecate that is common to many cases, is a very annoying symptom. Strong thorough treatment over the sacral region by inhibition over the sacral foramina and by relaxing the tense muscles of the sacrum will relieve this condition. In relaxing these muscles place the whole hand against the muscles and push upward toward the occiput. This treatment inhibits the nerves to the rectum and lessens the tenesmus.

Attention should be paid to the liver to keep it active. Washing out the large bowl with tepid water produces a soothing effect, besides having a tendency to allay inflammation. The blandest of liquid foods should be given, as peptonized or boiled milk, broths, beef juice, barley and rice. The patient should remain in bed until completely cured.

AEMOEBIC OR TROPICAL DYSENTERY.

This form prevails in the tropical and subtropical countries for the most part, and seems to be excited by an animal parasite, the *amoeba coli* or *dysenteriae*. This is constantly found in the stools, the tissue of the intestine and also in the pus of the liver abscesses, which are secondary to dysentery. Amoebae are sometimes found in the stools of healthy men which probably entered the system through the drinking water.

Morbid Anatomy.—The mucous membrane is swollen. This is due to the oedema and cellular infiltration of the submucous coat. Round, oval or irregular undermined ulcers are found. The lower part of the ilium may be in-

vaded with these ulcers. The ulcers may be so deep that their floor is formed of the muscular or even the serous coat. The disease progresses through infiltration of the connective tissue layer of the bowels. This causes superficial necrosis and the formation of the irregular undermined ulcers. In some cases false membrane and sloughs are formed.

Symptoms.—The onset may be either sudden or gradual, with a very irregular diarrhoea, moderate fever, and copious liquid stools, abounding in the amoebae coli. The straining is less severe and persistent than in catarrhal dysentery and may be absent. Sometimes there is nausea and vomiting.

Complications.—Abscess of the liver is the most common, which may be single or multiple. When single it generally involves the right lobe. Multiple abscesses are small and generally superficial. The abscess walls are ragged and necrotic, the older abscesses have whitish, smooth, fibrous walls. These abscesses do not contain pure pus, but matter consisting of a fatty and granular debris containing the amoebae and a few cellular elements. Sometimes these abscesses extend into the lung. In addition to the abscesses there are found in the liver local necroses of the parenchyma scattered throughout the organ and due to the action of the amoebae.

Diagnosis.—Cases last from six to twelve weeks. The termination is most variable in the uncomplicated cases.

Prognosis.—Is generally unfavorable on account of the exhausted condition of the patient. Relapses often occur and the cases may become chronic.

Treatment.—In this form of dysentery the treatment is largely the same as in the acute catarrhal form. The spinal lesions affect the innervation to the intestine, thus producing a stasis in the circulation; this condition favoring, and in fact, inviting the retention of the amoeba coli in the system at this point.

The diet is the same as in other forms of dysentery. Rectal injections and hot applications to the abdomen are useful. In all cases where strong treatment has been given to the spinal column a quieting treatment to the nervous system and an inhibitory treatment to the heart will be gratefully received by the sufferer. Both of these effects can be accomplished at the same time by simple inhibition of the occipital nerves. The stools should be taken care of immediately and disinfected.

DIPHTHERITIC DYSENTERY.

By far the most serious of all forms of dysentery.

Etiology.—As a primary disease coming on acutely it is commonly thought to be due to the action of a vegetable organism found in impure drinking water. This is sometimes fatal.

As a secondary disease it occurs at a terminal event in many acute and chronic diseases. It is sometimes found in chronic Bright's disease and it is not infrequent in chronic heart disease, cachectic states and in acute diseases with pneumonia. This variety prevails in epidemic form, often attacking camps, hospitals and crowded cities.

Morbid Anatomy.—In the milder forms the tops of the folds of the colon are capped with a thin yellowish membrane. In severer forms the mucous membrane is intensely swollen. The colon is greatly enlarged and covered with a false membrane resulting from coagulation-necrosis. This membrane is thick and adherent and whenever it becomes separated there is ulceration and sloughing.

Symptoms.—In a secondary form these are less severe than in the primary. They are the ordinary symptoms of the catarrhal form, intensified with the following typhoid symptoms: muttering delirium, stupor, brown furred tongue and bloody stools containing false membrane and sloughs.

Complications and Sequelae.—Abscess of the liver is by far the most serious complication and is most frequently caused by foci of suppuration forming in and extending along the vessels of the portal system and passing as an embolus into the liver. A local peritonitis may arise by extension of the inflammation and perforation. This is not a very rare complication and may be followed by peritonitis which is usually fatal. Paralysis in the form of paraplegia is not an uncommon sequela. In severe, long continued cases pleurisy, pericarditis, endocardis and occasionally pyaemic manifestations and chronic Bright's disease may be sequelae.

Diagnosis.—The diagnostic symptoms are the same as in the other forms of dysentery but manifested to a greater degree. We recognize this variety also from its epidemic form.

Prognosis.—This is the most unfavorable of all forms of dysentery, most cases proving fatal.

Treatment.—Correction of the lumbar lesions are indicated, and strong stimulation of the splanchnic nerves with inhibition of the vagi to lessen peristalsis, especially when the necrotic membrane is being removed, so that the ulcerated surface will heal more quickly.

Peptonized milk, beef peptonoids and beef juice are the best foods. Foods that are non-irritating, but nourishing and leave as little residue as possible are the ones required.

CHRONIC DYSENTERY.

This is generally resultant from an acute attack, though the amoebic form may be sub-acute from the onset.

Morbid Anatomy.—The coats are generally thickened especially the submucosa and the muscular coats being hypertrophied. Ulcers are usually present, although there are cases in which there are no ulcers. Cicatricial contractions

sometimes follow and the calibre of the bowels is reduced, strictures being rare.

Symptoms.—There is a progressive loss of flesh and strength, little or no tenesmus, slight colicky pain and extreme anaemia. The stools contain mucus, at times blood, and the bowels move from two to twelve times a day.

Diagnosis.—The history of the initial symptoms will establish the diagnosis. It is not always possible to distinguish between chronic dysentery and chronic diarrhoea.

The duration is from a few months to several years.

Treatment.—Rest and a liquid diet are most essential. Foods that are easily assimilable and nourishing, with a minimum amount of residue, are required. Beef juice, beef peptonoids and peptonized milk are the types of food.

In cases that become chronic the spinal column oftentimes exhibits lesions above and below the lumbar region. Undoubtedly they are lesions of secondary importance in comparison to the lumbar lesions, but it is important that they be corrected. The treatment requires thorough careful work with the disordered spinal column and lower ribs. Occasionally a slight kyphosis is present in the dorso-lumbar region that demands persistent work in order to correct it. An occasional rectal injection is beneficial, especially in cases that have slight ulceration of the sigmoid flexure or rectum causing colicky pains and a few loose stools in the morning, the patient being in fairly good health during the rest of the day.

ERYSIPELAS.

Synonyms.—The rose; St. Anthony's fire; erysipelatous dermatitis.

Definition.—An acute infectious specific disease; characterized by a peculiar inflammation of the skin, due to streptococci, with a tendency to spread.

Etiology.—It occurs in epidemic form, especially in the spring of the year. One attack predisposes to a second. Family predisposition exercises a slight influence. Slight abrasions, lacerated wounds, especially of the scalp, may be the starting point of an attack. Persons having skin diseases and wounds, and women who have been recently delivered are liable to be affected. Chronic Bright's disease, chronic alcoholism, syphilis, debility, phthisis, organic heart disease and unhygienic surroundings are predisposing causes. Lesions are found to the vaso-motor fibres and lymphatics of the affected area.

The specific virus is the streptococcus erysipelatis which acts as a local irritant producing the dermatitis. The fever and constitutional symptoms are due to toxic agents.

Morbid Anatomy.—It is a simple inflammation and if uncomplicated no other structures are involved. The visceral complications are numerous and are of a septic character. Septic endocarditis, pericarditis, and pleuritis may occur. Infarcts occur in the spleen, kidneys and lungs.

Symptoms.—The incubation period varies from one to eight days. The stage of invasion is often marked by a chill, followed by fever, which rapidly rises to 104 or 105 degrees F. If there is a local abrasion the spot becomes reddened; but if it is idiopathic, it begins as a small red burning spot, usually on the face or over the bridge of the nose. It spreads rapidly. The patch being elevated above the surrounding tissue. The swelling may be so great as to close the eyes and distort the features. The cervical lymph glands are swollen. The temperature continues high for four or five days and falls by crisis. The eruption begins to subside and a moderate desquamation occurs. If the disease takes a fresh start the fever again rises and continues as long as the disease spreads. There is usually headache and sometimes delirium.

As a result of intense infiltration the part may become gangrenous. Suppuration frequently occurs in facial erysipelas. The inflammation may extend to the mucous membrane of the throat and mouth.

Complications.—The complications are meningitis, oedema of the glottis (fatal), pneumonia, nephritis, ulcerative endocarditis and septicaemia. Albuminaria is almost always constant.

Diagnosis.—This is not difficult. The fever, the acuteness of the disease, the rapidly spreading eruption, and the constitutional disturbances will serve to distinguish it from all others.

Prognosis.—This is usually favorable, healthy persons rarely die. Many times convalescence is quite slow.

Treatment.—I have seen a number of cases of erysipelas cured by correcting disorders in the region of the 2nd, 3rd, 4th, and 5th dorsals. The lesions are principally subluxations of the ribs and severely contracted muscles. The disorder at the points named probably interferes with the vaso-motor nerves to the face; thus predisposing to an attack of erysipelas by allowing the micro-organism congenial tissue for its devastations. In some few cases derangements have been found higher than the upper dorsal, principally through the middle and upper cervical vertebrae. Lesions in these regions would also interfere with vaso-motor fibres, especially through the fifth nerve directly.

The treatment on the whole is to examine for lesions to the innervation of the affected region and remove them; besides giving attention to the bowels, a nutritious diet, and absolute rest. The patient should be isolated as there is danger of the disease spreading. In cases where there is much restlessness and insomnia treat the upper cervical region, especially the deep posterior muscles.

An application of vaseline locally to modify the heat and burning should be used, cold water applied locally is also useful. Pay particular attention to the deep muscles of the neck and to the first and second ribs with a view of relieving constrictions of the vascular channels that drain the head, especially lymphatics.

TUBERCULOSIS.

Definition.—A general or local infectious disease caused by the bacillus tuberculosis. This organism produces specific lesions taking the form of nodular bodies called tubercles or diffused infiltration of tuberculous tissue. These tubercules undergo caseation and sclerosis and may be followed by ulceration or in some situations calcification.

Etiology.—Tuberculosis exists in all countries. It generally prevails more extensively in warm than in cold countries. Toward the poles it is rare. Altitude, however, exerts more influence than latitude. The disease rarely occurs in mountainous countries owing to the purity of the atmosphere. The disease is very prevalent in the West Indies and the South Sea Islands. Tuberculosis is frequently met with in Canada among the French Canadians and the English. All races are liable to have tuberculosis, but the Indians of the continent, the South Sea Islanders and the colored race are very susceptible to the disease.

The tubercle bacillus was discovered by Koch in 1881. It is a short, straight or slightly bent rod. This bacillus is exceedingly tenacious of life and is found in greater or less numbers in all tuberculous lesions. They can live almost indefinitely outside the body. They are found in great numbers in the sputum which dries and flies in the atmosphere in the form of dust. The organism is thus widely spread in regions frequented by phthisical patients. The bacillus gains

entrance into the body by way of the respiratory tract in the vast majority of cases. Milk from tuberculous cows will produce the disease, especially in children, causing intestinal and mesenteric tuberculosis. The meat of tuberculous animals is not necessarily infectious, although there is a possibility of infection by this means. Tuberculosis may be transmitted by direct inoculation; this does not often occur in man, but when it does the disease usually remains local, although general infection may occur. Persons who follow certain occupations are more or less subject to local tubercle of the skin as butchers, dissectors of dead bodies and handlers of hides. The virus may enter the body through any fissure or excoriation on the skin; thus by washing the clothes or bed linen of phthisical patients, by the bite of a consumptive, or by a cut from a broken spit glass of a consumptive one may become infected. The disease may become congenital but this is extremely rare. In some cases the virus may be transmitted, but the disease may not appear for many years.

Predisposing Causes.—Hereditary predisposition which renders the person more liable to accidental infection, delicate constitution, scrofulous persons, previous infectious diseases, as influenza, whooping cough, measles, typhoid fever, diabetes mellitus, etc. In young children meningeal, mesenteric and lymphatic forms of tuberculosis are the most frequent. Pulmonary tuberculosis is usually met with in adults especially between twenty and thirty years of age. The development of tuberculosis is favored by damp localities. No race is exempt, but the colored race and the American Indians are especially predisposed. Improper and insufficient food, constant inhalation of impure air, and injuries to the chest, with or without laceration of the lungs are predisposing causes.

Local Causes.—Bronchial catarrh, diseases of the stomach and intestines, especially entero-colitis, tubercular pneumonia, pleurisy (rarely), intra-thoracic tumors and congenital or acquired contraction of the orifice of the plumonary artery increase the susceptibility to infection. Lessened vitality of the tissues, whether inherited or acquired, is necessary before the germ can become implanted and proliferate, producing tuberculosis of the tissues or organs. In nearly every instance lesions are found at the second, third or fourth ribs when the lungs are involved. These lesions undoubtedly predispose to the tubercular infection by lessening the vitality of the lung tissues through interference with the innervation or vascular supply. Possibly a lesion at the second rib or second dorsal vertebra would interfere directly with the vaso motor nerves of the upper thoracic ganglia. The condition of the middle and lower cervical vertebrae should be carefully examined, for lesions at that point would involve the lymphatics of the lungs. The osteopath is always able to locate a lesion which is interfering with the nutrition of the tissues infected. The lowered vitality caused by the lesion is the predisposing cause and the tubercular bacillus is the exciting cause which determines the character of the affection.

Morbid Anatomy.—In adults the favorite seat of tubercle is the lungs. In children the lymphatic glands, joints and bones. No organ is exempt, the salivary glands and pancreas are less frequently involved. The miliary tubercle is the beginning of tubercular deposits. This may develop in any tissue where the tubercle bacillus is found and it is only distinguished by the presence of a tubercle bacillus, as identical structures are produced by other parasites, such as aspergillus glaucus and actinomyces.

The following are the stages of development of the tubercle:

1. Proliferation of the fixed tissue cells, particularly those of the connective tissue and endothelium of the capillaries, due to the irritation produced by the bacillus producing the epitheliod cells and in some instances the giant cells in both of which bacilli may be found. The epitheliod cells vary in shape and may be rounded, polygonal or cuboidal. The giant cells are formed by enlargements of the epitheliod cells and a repeated division of their nuclei or possibly by fusion of several cells. They also contain bacilli, the number of giant cells and of the bacilli being largely reciprocal. In lupus, joint tuberculosis, and scrofulous glands in which the bacilli are relatively few the giant cells are numerous; while in the miliary tubercles in which the bacilli are numerous the giant cells are scanty.

2. On account of the inflammation produced by the bacillus there is a migration of leucocytes from the adjacent vessels and lymphoid cells. At first the leucocytes are chiefly polynuclear and are rapidly destroyed, but later mononuclear leucocytes (lymphocytes) appear which are able to resist the action of the bacilli and they do not undergo the rapid destruction of the other variety. A reticulum of connective tissue is formed around the various cells by the fibrillation of the protoplasm of the cells and the rarefaction of the connective tissue matrix. The tubercles are nonvascular and when once formed undergo caseation and sclerosis.

Caseation.—This is a process of cogulation necrosis or destructive changes beginning at the central part of the growth, due to the direct action of the bacilli. The primarily transparent tubercular tissue is gradually converted into a yellowish gray body, bacilli are, however, still present.

Most frequently the caseation is followed by softening, less frequently calcification or it becomes encapsulated.

Sclerosis.—During the time the cell destruction is going on at the center of the tubercle, hyaline transformation is going on with conversion of the cellular elements into fibrous tissue thus converting the tubercle into a hard, firm structure. In serous membrane, especially the peritoneum this fibroid change is seen in its completest development. In all tubercles one of these two processes occur either caseation and the destruction forces which is dangerous to the patient or sclerosis which is a conservative and healing process. The ultimate result in any case depends upon the power of the body to produce an antitoxin to overcome the effects of the special toxin produced by the bacilli.

Diffused Tuberculous Infiltration.—This is the result of fusion of the new foci of infection or of miliary tubercles. An entire lobe or even the greater part of the lung may be involved and undergo caseation, usually, however, caseation takes place in small groups of lobules. The bacilli may cause a diffused infiltration and caseation without any special foci producing tuberculous pneumonia.

Secondary Inflammatory Processes.—The irritation of the bacilli is capable of producing associated inflammatory processes in its own neighborhood. There may be an overgrowth of interstitial tissue produced. In other instances changes similar to those of catarrhal or croupous pneumonia may occur. Suppuration is associated with tuberculosis, especially of the lungs, and is due to a mixed infection or the presence of pus organisms. Some authorities claim that the tubercle bacilli alone are able to produce suppuration; it is, however, more probable that suppuration is due to a mixed infection. The constitutional features in tuberculosis are more dependent upon this secondary infection,

especially by the streptococci, than upon the primary infection.

TUBERCULOSIS OF THE LYMPH GLANDS.

Synonym.—Scrofula.

Scrofula is a true tuberculosis of the lymphatic glands. The virus is, however, less virulent than that derived from other sources, which accounts for the slow development and milder course of tuberculosis of the glandular system.

Etiology.—Tuberculous adenitis may occur at all ages, but is most common in children and young adults. It is rarely congenital. Catarrhal inflammation of the mucous membranes weaken the resisting power of the lymph tissue, thus allowing the bacilli to develop and is an important predisposing cause. The glands most frequently affected are those of the neck, more rarely there is involvement of all the lymphatic glands of the body. Usually lesions of the upper and middle cervical vertebrae are found, as well as lesions to the lymphatics at various points along the spinal column and the ribs; these lesions probably affect the innervation to the lymph glands and thus predispose to the disease. In all cases anatomical derangements are found in the region of innervation to the involved gland.

General Tuberculous Adenitis.—All the lymph glands of the body are more or less involved, while the other organs and tissues are rarely affected. All the visible glands are found to be swollen, tender and painful. There is more or less protracted fever with wasting and debility.

Local Tuberculous Adenitis—Cervical.—The glands of the neck are most frequently affected and this is especially the case with children. Negroes are more frequently affected than whites. It is seen especially among those living in badly ventilated lodgings and among the very poor classes. The

submaxillary glands are usually the first involved and are affected on one side more than on the other, as a rule. At first they are swollen to various degrees and are tender; later they suppurate and rupture if not properly opened by a surgeon. The skin over the glands is usually freely movable, it may, however, be adherent.

The glands above the clavicle, those in the posterior cervical triangle, and the axillary glands may all be affected. In such cases it is likely that the bronchial glands are also involved and may become the exciting cause of tuberculous pleurisy or of pulmonary tuberculosis.

This affection runs a very slow course, lasting often for a number of years.

Bronchial.—These glands may be affected primarily or secondarily to infection of the lungs. The primary form is seen most commonly in children and it is apt to be associated with suppuration.

Systemic infection may follow the rupture into a vessel. Local infection of the lung may occur and the pericardium become infected.

Mesenteric (*Tabes Mesenterico*).—These cases occur among children and it may be primary or secondary. The primary form is very common in children associated with intestinal catarrh. The trunk and limbs are puny, wasted, and anaemic; while the abdomen is enlarged and tympanitic. Diarrhoea is marked and constant, with thin, offensive stools. Fever is almost constantly present and is of an intermittent type. In the majority of cases the intestines do not show tuberculous lesions. The disease is most frequently met with among poor children in unhygienic, illy-ventilated houses. There may be tuberculosis of the peritoneum; in such instances the abdomen is hard, large and tender and uneven nodules may be felt. In adults pulmonary tubercu-

losis may be followed by involvement of the mesenteric glands or the mesenteric glands may be involved primarily.

Diagnosis.—*Lymphadenoma (Hodgkin's Disease).*—Occurs at any age. It is not frequently met with in the young and is more common in males. The glands of the anterior and posterior cervical triangles are usually affected first.

ACUTE TUBERCULOSIS.

Synonyms.—Acute miliary tuberculosis; diffused general tuberculosis.

This form shows best the truly infectious nature of tuberculosis. In it miliary tubercles develop in many and widely separate parts of the body. In some cases these growths seem to be uniformly distributed throughout all the viscera. In other instances they are localized as in the lungs (pulmonary variety) or in the meninges of the brain (meningeal variety).

Etiology.—In nearly every instance it is an auto-infection arising from an old tuberculous focus, which may be latent and quite unsuspected. General infection in most instances arises from the rupture of a nodule into a vein, from tuberculous lymph glands, tuberculosis of the bones, joints, or even the skin.

Three chief clinical forms are recognized, acute general infection without special localization; marked pulmonary symptoms; or marked cerebral or cerebro-spinal symptoms.

GENERAL MILIARY TUBERCULOSIS OR TYPHOID FORM.

Symptoms.—They are those of a general infection of the body and resemble to a marked degree the symptoms of typhoid fever. The onset is rarely rapid. In most cases there is a period of incubation during which the health fails, the appetite is lost, headache occurs, and the patient soon be-

comes feverish with increased debility. Epistaxis is of rare occurrence. The temperature rises and the pulse is rapid and feeble. The tongue is dry and sometimes brown. The respirations are accelerated. Delirium may be present. In rare cases there may be little or no fever. The temperature ranges from 101 to 103 or even 105 degrees F. It is irregular and marked by evening exacerbations and morning remissions. Occasionally there is an inverse type of temperature in which the temperature rises in the morning and falls in the evening and is held by some to be characteristic. The countenance is dusky. In some cases the pulmonary symptoms are marked, while in others the meningeal symptoms are more prominent. Tubercle bacilli are rarely found in the sputum.

The spleen is usually enlarged. Constipation is present as a rule but there may be diarrhoea and haemorrhage from the bowels may occur. The urine may contain traces of albumin. There may be excessive sweating, and herpes are often present. Rarely jaundice occurs. Choroid tuberculosis is frequently met with. In doubtful cases the blood should be examined for tubercle bacilli, although they are not always present.

The duration is from two to four weeks, the disease usually terminating unfavorably.

Diagnosis.—It is often very hard to differentiate between this form of tuberculosis and typhoid fever.

Typhoid Fever.—Epistaxis is a common early symptom. The temperature curve of the continued type is quite diagnostic. The respirations are moderately hurried and the pulse is often dicrotic. Diarrhoea is frequent. No tubercles are found on the choroid. No tubercle bacilli are found in the blood. Haemorrhages from the bowels are common.

PULMONARY FORM.

Symptoms.—When the lungs are chiefly affected the pulmonary symptoms are marked from the onset. It may develop suddenly or there may be a long period during which the general health fails markedly. In children the disease may follow measles and whooping cough. There is dyspnoea, a marked cough and the expectoration is muco-purulent and occasionally rusty. There is broncho-vesicular breathing with sibilant and subcrepitant râles. The temperature is high, ranging from 103 to 105 degree F., or higher. The pulse is rapid and feeble. Cerebral symptoms are rare.

Duration.—The disease may last from several weeks to even months; or on the other hand it may prove fatal within ten or twelve days. As the end draws near the signs of suffocation become intensified.

Diagnosis.—There may be history of tuberculosis in the family or of a previous cough. Occasionally tubercle bacilli are found in the sputum. The marked general symptoms, together with the dyspnoea and cyanosis will generally decide the diagnosis. In doubtful cases the blood should be examined if possible.

CEREBRAL OR MENINGEAL FORM.

Tuberculous Meningitis.—This form which is sometimes called acute hydrocephalus occurs quite frequently and is an acute tuberculosis of the membranes of the brain, sometimes of the cord.

Etiology.—It occurs most frequently between the ages of two and seven years, although it may occur at any age. A focus of old tuberculous diseases, especially in the bronchial glands, or a history of a fall will often be found as the cause. Rarely does the disease involve the meninges primarily.

Morbid Anatomy.—This is very characteristic. The meninges at the base of the cerebrum (basilar meningitis) are most involved. There is more or less inflammation with fibrous purulent exudation which is usually abundant in the Sylvian fissures. The tubercles vary in size and number, in some cases they are very apparent, while in others they are very difficult to find. The lateral ventricles are dilated and filled with a turbid fluid. The convolutions are frequently flattened and the sulci obliterated on account of the undue intraventricular pressure. The meninges are not alone involved, but the cortex to a variable depth is more or less oedematous; while tuberculous infiltration of the cranial nerves occurs.

Histology.—The tubercles develop in the perivascular sheaths which are distended with lymphoid and epitheloid cells. The lumen of the vessels is changed and thrombosis of the arteries may occur. The spinal meninges may also be involved.

Symptoms.—*First Stage, Irritation.*—Prodronal symptoms are usually present, lasting one or more weeks. Headache, vomiting and chills, followed by a fever, are the initial symptoms. The child gets thin, pale, restless, and peevish, the appetite is lost, the bowels constipated and the urine diminished in quantity. The onset is usually gradual, but when the onset is sudden the disease is generally ushered in with a convulsion. The fever rarely rises above 102 or 103 degrees F. At first the pulse is slightly accelerated, but soon becomes slow and irregular. The pain is often agonizing and intense causing the child to give a short, sudden cry, the hydrocephalic cry. During sleep the child is restless and there are slight muscular twitchings. The pupils are contracted and the skin is dry and harsh.

Second Stage.—The irritative symptoms now abate. Vom-

iting and headache subside and the child becomes quiet and is dull and apathetic. Constipation still persists. The abdomen is boat shaped and the head is often retracted, the child cries out only occasionally. The pupils are dilated. Convulsions may occur. The temperature ranges from 100 to 103 degrees F. The respiration is irregular and sighing and a patchy erythema may appear on the skin.

The Stage of Paralysis.—The mental faculties are lost, the coma increases and the child cannot be roused. Convulsions or spasmodic contractions of the muscles of the neck, back and limbs may occur. The pupils are dilated, the eyelids partly closed and the eyeballs are rolled up. The child may drop into a typhoid state with diarrhoea, great prostration, dry tongue and low delirium. The pulse becomes frequent, irregular and small. The temperature rises to 106 or 107 degrees F. In rare cases the temperature may become subnormal (93 or 94 degrees F). The duration is from two to five weeks. A more rapid form occurring most frequently in adults sets in with great violence and runs its course in a few days. It is a very rare but exceedingly fatal form.

Prognosis.—Generally very unfavorable, a few cases have recovered.

ACUTE PNEUMONIC PHTHISIS.

Synonyms.—Galloping consumption; pulmonary tuberculosis; phthisis; consumption; florid phthisis.

The infection of the lungs is rapid and may be primary or secondary. This form is met with most frequently in children and young adults but may occur at any age.

Two forms may be recognized, the *broncho-pneumonic* and the *pneumonic*.

Symptoms.—The *broncho-pneumonic* form is the most common and occurs most frequently in children. It most frequently follows the infectious diseases, especially measles

and whooping cough. The child may be taken ill suddenly with what seems to be an ordinary bronchitis, the temperature rises rapidly, the cough is severe, and there may be signs of consolidation with submucous and subcrepitant râles. The child has sweats. The fever may become hectic. There is rapid loss of flesh and in many cases the disease develops into chronic phthisis. In other instances death occurs in from three to eight weeks.

In adults the attack may occur in persons in good health or run down with over work. In a few cases the attack is ushered in with a haemorrhage. There is high fever, rapid pulse, increased respiration and rapid wasting. Elastic tissue and tubercle bacilli are found in the sputa. Death may occur in three weeks. Other cases begin to improve in six or eight weeks, which is followed again by a decline, the case is dragged on and becomes chronic.

The Pneumonic Form.—It is more rare than the broncho-pneumonic form and may be very rapid in its course, also. The attack sets in abrupty with a chill and the temperature rises rapidly. There is pain in the side, cough, dyspnoea, and mucous and rusty sputum which may contain tubercle bacilli. There is upon physiological examination impairment of resonance, well marked bronchial breathing and increased fremitus. The whole or part of the lung may show signs of consolidation and dullness, all the symptoms of pneumonia being present. This attack may come on in a person in good health after exposure to cold; there may have been debilitating circumstances or a predisposition to phthisis.

Death may occur in the second or third week or the case may drag on from three to four months.

Morbid Anatomy.—*Broncho-pneumonic Form.*—The air vesicles and bronchioles become blocked with a cheesy substance. The solidified areas have a grayish red appearance

at first, but later they are of an opaque white. These areas are usually separated by areas of crepitant air tissue, but by fusion of contiguous smaller areas large areas are involved, sometimes the whole lobe. In other instances the masses are small and widely separated. These areas tend to break down with the formation of irregular cavities.

The Pneumonic Form.—One lobe only is usually involved, though sometimes the entire lung. The lung is heavy and airless, sinking quickly in water. There is destruction of lung tissue and upon section cavities are found. The cavities are generally small and are surrounded by tubercles in the consolidated tissue. Older caseous areas of a yellowish white color may be visible. Only the most careful examination will reveal the presence of miliary tubercles and it is sometimes very difficult to distinguish tuberculous croupous pneumonia from the ordinary form. The other lung and the bronchial glands should always be examined when tuberculosis is suspected.

Diagnosis.—In the broncho-pneumonic form it is very difficult in the early stages to distinguish it from simple bronchitis and broncho-pneumonia. In this form the sputa will show elastic tissue and tubercle bacilli early in the disease and should be examined carefully if the disease lasts more than three weeks.

In the pneumonic form it is impossible to make a diagnosis early in the disease. Tuberculosis may be suspected if the patient has been in bad health, has a predisposition to phthisis, or has had any pulmonary trouble. The fever in true pneumonia should abate between the eighth and tenth day; if it continues after the twelfth day at the latest, phthisis should be suspected. The sputa should then be carefully examined and if elastic tissue and tubercle bacilli be found the diagnosis is at once set at rest.

Prognosis.—The patient rarely lives a year. Death usually occurs in from a few weeks to a few months.

CHRONIC ULCERATIVE PHTHISIS.

Synonyms.—Chronic pulmonary tuberculosis; slow consumption.

This form is much more common than the acute form. In this form the lesions ulcerate and soften. To the primary tuberculous infection is sometimes added septic infection producing a mixed disease.

Morbid Anatomy.—The primary lesion is not actually in the very apex, but a little below it and near to the posterior and external borders. From here the disease spreads downward and rather backward and for this reason examination in the supraspinous fossa will give the first manifestation of disease. In a large proportion the starting point of the process is in the smaller bronchi and the bronchioles and their alveolar territories soon become blocked with inflammation products. These areas soon undergo caseation. Ulceration occurs in the bronchial walls; the caseous matter softens and breaks down, resulting in the formation of a cavity. The more rapidly the caseous masses are formed the more apt are they to soften. In other instances fibroid transformation or calcification with encapsulation of the cheesy matter takes place and recovery may occur. In many instances these processes are not complete, the apparently healed lesions undergo ulceration and these calcareous bodies may be expectorated.

Large cavities have a well defined limiting membrane. The contents are usually purulent, rarely are they gangrenous. The surface of the smooth walled cavities constantly produce pus. New cavities have walls made up of softened necrotic caseous masses; they develop near a healed focus or near a large old cavity with limiting walls and if situated

just beneath the pleura they may rupture and cause pneumothorax.

Quiescent cavities are generally small, though they vary in size. The lining membrane of these old cavities may be smooth, resembling mucous membrane. Medium sized and large cavities do not heal completely. The cavities are more frequently single, but they may be multiple and series of these small cavities may be surrounded by fibrous tissue.

Pneumonia often occurs in the neighborhood of a tubercular infiltration. The alveoli are filled with epitheliod cells.

The area is hyperaemic, hard and consolidated. In some instances the contents of the alveoli undergo fatty degeneration. Pleurisy is constantly associated with a chronic form of phthisis. Sero-fibrinous, purulent or haemorrhagic pleural effusions are met with. The pleurisy may be simple, but in a great many cases it is tuberculous, miliary tubercles and cheesy masses may be found in the thickened membrane.

Changes in the Other Organs.—The bronchial glands are swollen, oedematous and contain tubercles. They may become caseous and sometimes calcareous. Not infrequently they undergo purulent disintegration. Tuberculosis of the larynx is common. Ulceration, especially, of the vocal cords, and destruction of the epiglottis may occur.

Tuberculous endocarditis is not very uncommon.

Amyloid changes of certain organs, especially the kidneys, liver, spleen, and mucous membrane of the intestines, is frequent. Enlargement of the liver due to fatty infiltration, often occurs.

Tuberculous lesions are found in the intestines, spleen, kidneys, and brain in nearly equal proportions, then the liver and pericardium. Other groups of lymphatic glands besides the bronchial may be affected.

Modes of Onset.—*With Gastro-Intestinal Symptoms.*—There is feeble digestion and the patient soon becomes pale, loses flesh and looks debilitated before indications of pulmonary tuberculosis develop.

With Pleurisy.—This may be acute pleurisy with effusion or the effusion may develop slowly. It may be a dry pleurisy beginning at the apex or in a scapular region.

With Laryngeal Symptoms.—This is a rare form and begins with huskiness and loss of voice. Examination of the sputum will be necessary, as tubercle bacilli may be found in the sputum before the physical signs in the lungs are at all distinct.

With Chills and Fever.—In malarial districts such cases are frequently diagnosed as ordinary intermittent fever.

With Haemoptysis.—This may occur in a person of apparently perfect health. It is probably due to a localized lesion in the lungs which has not produced any symptoms. Sometimes the pulmonary symptoms follow rapidly, in other cases the symptoms may be absent for a long time, and in rare cases permanently.

With Bronchitic Symptoms.—Cases of this kind arise frequently from a neglected cold. The patient takes cold readily and a bronchial cough develops which persists. Physical signs may be negative for sometime. Examination of the sputum will discover the nature of the disease.

Symptoms.—There are (1) local and (2) general symptoms.

Local Symptoms.—Pain.—This may be early and moderately severe or absent throughout. It is most severe when associated with pleurisy; when it is of a sharp cutting character. It may result from incessant coughing. The pain is usually situated at the base, but may be beneath the scapula or at the apex.

Cough.—This is present in the majority of cases and is an

essential feature. At first it may be slight, but as a rule grows worse as the disease progresses. It is dry and hacky at the beginning, later it becomes looser and accompanied by a muco-purulent expectoration. In other instances the cough may be absent. Paroxysms may occur after meals and cause vomiting. The cough is generally more pronounced in the morning or after a sleep. It may be so distressing at night as to prevent sleeping.

Expectoration.—This varies with the stage of the disease. At the beginning it is scanty and mucoid. The appearance of small grayish or greenish-gray purulent massss first suggests the nature of the disease. When softening begins the expectoration becomes more profuse and purulent. After the formation of cavities, a circumscribed circular shape is assumed, the so-called nummular (coin-shaped) form. These masses are distinct, airless, opaque, greenish gray in color and sink rapidly when discharged into the water. Microscopically the expectoration is made up of pus cells, alveolar epithelium, elastic tissue, innumerable tubercle bacilli, blood, and oil drops.

Haemoptysis.—This is met with at two periods of the disease, either early or late, when there is softening or excavation. Early haemorrhages are due to rupture of weakened blood vessels and are usually moderate. Late haemorrhages are due to erosion of the blood vessels or a rupture of a small aneurism and may prove fatal. The blood may be mixed with the sputum or it may be pure. When mixed with mucus the blood probably comes from the mucous membranes of the bronchial tubes. When pure it is due to erosion of the vessels.

Dyspnoea.—This is not marked even in advanced pulmonary lesions.

General Symptoms.—Fever.—This is of the continued type

at the onset due to the development of the tubercles and to inflammation and is a constant symptom.

Two types of fever are met with—the remittent and the intermittent. Fever is probably always present at the onset of the disease, but after the disease is once established fever may be absent.

A remittent fever may be present from the start, but is most common in the middle and later stages. This form of fever is usually associated with softening and extension of the disease.

An intermittent or hectic type of fever is characteristic of breaking down of the lung tissue and cavity formation, associated as these processes invariably are with suppuration.

Pulse.—This is always frequent and gradually becomes feeble as the affection advances. When the fever is high it is greatly increased in frequency, small, and compressible.

Emaciation.—This is a prominent symptom. Loss of weight is gradual, but progressive if the disease is advancing.

Sweating.—This is sometimes limited to the head and neck. Sweats may occur at any time, but especially during sleep; they may come on early in the disease, but are more apt to occur during the progress of cavity formation.

Symptoms Presented by Other Organs.—The Heart.—With retraction of the left upper lobe the area of the heart's impulse is increased and there may be pulsation in the second, third and fourth interspaces near the sternum. Systolic murmurs are commonly heard. Chronic endocarditis is not uncommonly associated with phthisis.

Gastro-Intestinal Tract.—The tongue is frequently furred, more often it is clear and red. Aphthous ulcers are common. Tuberculous lesions of the pharynx may interfere with deglutition. The appetite is impaired or lost; there

may be nausea, vomiting and thirst. The causes of gastric symptoms are not clear.

Diarrhoea is a frequent symptom, which may come on early in the disease, but more usually it appears at an advanced period and is commonly due to tuberculosis of the bowels. It may also be due to a catarrhal, ulcerative or amyloid condition of the intestines.

Genito-Urinary System.—Albuminuria is often present in advanced stages and may either be of an ordinary febrile nature or it may result from chronic nephritis. Amyloid changes are not uncommon and are attended by albumin and tube casts in the urine. Haematuria is not a frequent symptom. Pus in the urine may be due to disease of the bladder or kidneys.

Cutaneous System.—The skin is apt to be dry, harsh and scaly, and the hair of the head and beard may become dry and lanky. The end of the fingers are bulous (clubbed), and the nail curves over the end. There may be pigmentary staining over the chest (chloasma phthisicorum); and upon the chest and back as well, are frequently seen brown stains, the pityriasis versicolor.

Nervous System.—The mind, as a rule, is exceptionally clear. The patient is hopeful and buoyant even in the advanced stages. Tuberculous meningitis and tuberculous meningeal encephalitis may develop. The symptoms vary according to the seat of involvement. If in the fissure of Sylvius, aphonia or even hemiplegia may result. It is nearly always an extensor paralysis of the leg, sometimes of the arm. Peripheral neuritis is not frequent. A form of insanity not due to nervous lesions may develop. It is not unlike that which occurs during the convalescence from acute affections.

Physical Signs.—*Inspection.*—The shape of the chest is often characteristic. A phthisical thorax is flat, the inter-

costal spaces are wide, the costal cartilages are prominent, and the sternum is depressed. Sometimes the lower sternum forms a deep concavity (funnel breast). The scapulae may be distinctly winged. Another type of thorax is long and narrow, the ribs are more vertical in direction, the intercostal spaces are wide, and the costal angles are very narrow. In other instances the chest is of apparently normal build. Defective expansion is observed early, especially at the apex of the affected side. The clavicle of the affected side often stands out more prominently, while the spaces above or below it are often more marked.

Palpation.—There is difficult expansion and increased vocal fremitus. Normally the fremitus is stronger at the right than at the left apex. If the pleura is thickened the vocal fremitus is obscured, and if there is pleural effusion it is diminished or absent.

Percussion.—If the diseased areas are minute the percussion note may not be changed. Dullness is first noted as a rule above, on or below the clavicle. In the early stages the percussion note is of a slightly higher pitch. In many cases the tympanitic sound is present.

Auscultation.—The breathing is harsh and the expiration is prolonged and high-pitched (bronchial). Early in the disease crackling râles may be heard. When softening occurs they become moist, louder and sometimes bubbling. These may be heard upon inspiration and expiration. Pleuritic friction sounds may be heard at any stage.

The signs of cavity are:

Percussion.—There is more or less defective resonance or tympany. Over large cavities a "cracked pot" resonance is obtained. This is best obtained when the patient has his mouth open. There may be normal resonance if the cavities are covered with a considerable thickness of unaffected air cells.

Auscultation.—This may detect cavernous or amphoric breathing, pectoriloquy and coarse bubbling râles. Metallic tinkling may be heard over large cavities.

Diagnosis.—Bacilli may be found in the sputum before the physical signs are well developed. It may be necessary to examine the sputum several times before the tubercle bacilli are detected. Only the presence of bacilli set the diagnosis at rest.

Prognosis.—The prognosis of pulmonary tuberculosis varies greatly in different cases. Undoubtedly a number of cases have been cured; even spontaneous cures have occurred. A great deal can be done to prolong life and to make the patient comfortable.

FIBROID PHTHISIS.

Definition.—This term is applied to a form in which there is induration followed by contraction of the affected lung tissue due to an overgrowth of fibroid tissue. The greater number of cases are primarily tubercular, but have run a fibroid course. Other cases are primarily fibroid, followed by tuberculous infections. It may begin as an ordinary ulcerative phthisis, or it may begin as an inhalation bronchitis. In other instances it may follow a chronic tuberculous bronchial pneumonia and chronic tuberculous pleurisy.

Symptoms.—The onset is extremely insidious. There is persistent cough often paroxysmal in character. Dyspnoea is marked, especially on exertion, but little or no fever is present. The expectoration is purulent and if bronchiectasis is present it may be fetid.

It is a disease of long duration, lasting from ten to twenty years. The patient is often able to pursue some occupation and may have fair health.

Physical Signs.—The chest is sunken, the heart is fre-

quently dislocated, and if the left lung is involved distinct cardiac pulsation is sometimes seen in the second, third and fourth interspaces. There is marked dullness over the affected side. There is distinct bronchial breathing at the base, while at the apex there may be cavernous sounds.

There may be hypertrophy of the right ventricle, sometimes of the entire heart. The bronchi are dilated. The clinical history is identical with that of simple cirrhosis of the lung from which it is often separated with difficulty. Both lungs may become the seat of tuberculous disease. As a result of prolonged suppuration amyloid changes in the liver, spleen, kidneys, and intestines may take place. Dropsy often closes the scene from failure of the right heart.

COMPLICATIONS OF PULMONARY TUBERCULOSIS.

The complications are lobar pneumonia, erysipelas, typhoid fever, chronic nephritis and chronic endocarditis.

MODES OF DEATH.

Death may occur by gradual asthenia, syncope, asphyxia (rarely), haemorrhage, tuberculosis of other organs (intestines, genito-urinary tracts and meninges, especially).

TUBERCULOSIS OF THE SEROUS MEMBRANES.

The pleura, pericardium and peritoneum may be chiefly involved, either simultaneously or consecutively.

TUBERCULOSIS OF THE ALIMENTARY TRACT.

The lips (rarely), tongue, palate, tonsils, pharynx, oesophagus, stomach and intestines may be invaded by tuberculosis.

The liver, genito-urinary system, arteries, veins, brain, cord, and mammary gland may also be involved.

Treatment of Tuberculosis.—A great many cases of tuberculosis of various tissues have been treated osteopathically.

Tuberculosis can be treated successfully, provided the disease has not progressed to a late stage; although many times in the later stages life can be considerably prolonged by careful treatment.

The prophylactic treatment of tuberculosis should receive first consideration. The sputum should be thoroughly disinfected and care taken that the patient does not spit about carelessly. A spit-cup should be provided and the sputum collected which is to be destroyed by burning and the cup sterilized. The patient should be well taken care of and given a separate apartment so that the danger of conveying the disease to others is reduced to a minimum. He should occupy a single bed. All unnecessary furnishings of the room should be removed and the objects that remain in the room are to be frequently aired and disinfected. The environment of the patient should be as favorable as possible to hygienic living. Many times a change of residence is of great benefit to the patient. When possible the patient should be out of doors and light exercise taken. The body should be well protected by flannels, the year around.

Another important consideration in the prophylactic treatment is the inspection of dairies and slaughter houses. The disease may be transmitted by infected milk. There is less danger of infection through meat; although all animals that present distinct lesions should be confiscated.

The treatment of the disease consists primarily in locating the cause of the devitalized condition of the cellular tissue. This is the vital point to be considered and requires a thorough examination of anatomical structures in the region involved. There is a reason why the tissues are in a depraved state and it is our business to examine the structures thoroughly that might become deranged anatomically and cause an obstructive innervation or vascular supply to the infected tissues. The disease is not primarily due to the

bacilli; the bacilli would not have infected the system had it been in a healthy state. Hence the object of the treatment in tuberculosis is to favor a building up of normal, well-nourished tissues so that it is impossible for the bacilli to infect the region. Of course, destruction of the bacilli are important, but we cannot expect to do much by the use of some parasiticide, for we are not then influencing or effecting the real cause of the disease. If we can improve the arterial circulation to the diseased tissues we will be striking at the root of the disease and the healthy blood will be the only parasiticide necessary. This is where the osteopathic theory of the cause of disease differs from that of other schools of medicine. At the local points of infection there is a decided malnutrition of the tissues due to a lack of proper blood to the parts, thus favoring the lodging of micro-organisms; by re-establishing normal nutrition to the diseased tissues, nature will repair the tissues if the condition is curable. No doubt antiseptic inhalations or a parasiticide taken internally has a tendency and does occasionally, destroy the specific cause (the micro-organism); but it is impossible for such medication to do anything more. It does not affect the real cause (the obstructed blood supply); although the use of a parasiticide with careful attention to the general health of the patient, will probably result in a cure in such cases where the disease is not far advanced. It would give nature an opportunity to exert such forces that were probably rendered latent by the environment of the patient. How much more scientific though, is the osteopathic treatment, when the chief attention is given to the *causes* that produced the local weakened circulation and a consequent depraved cellular tissue, thus allowing the bacillus to gain an entrance into the tissues. Hence it can be seen at once that if the case is curable

osteopathic medication would meet the demands scientifically.

The preceding is the key note of osteopathic therapeutics; not only in the treatment of tuberculosis, but in all diseases where micro-organisms play an important part. In tuberculosis of any part of the body, it is the duty of the physician to carefully examine the structures that may become anatomically deranged from any cause affecting the nerve, blood and lymphatic supply to the tissues or organs diseased. Correction of these anatomically deranged tissues and attention to the hygiene, diet, and general health of the patient constitutes the treatment.

In cases of pulmonary tuberculosis there is usually a dislocation of the second, third or fourth ribs over the diseased lung. In the majority of cases I believe these dislocated ribs are the real cause of pulmonary tuberculosis. Such a lesion would produce a weakened circulation in the lung tissue, chiefly underneath the deranged ribs and thus favor a deterioration of the lung tissue. No matter what part of the lungs are involved, a rib lesion or a corresponding vertebral lesion will be found. Another place that is oftentimes involved in pulmonary tuberculosis is in the locality of the second and third dorsals. Lesions of the ribs and vertebrae would interfere not only with the intercostal nerves but with the dorsal sympathetic ganglia and thus have a direct influence upon the vaso-motor nerves to the lung tissues. Again, lesions are apt to occur in the middle and inferior cervical vertebrae which would involve the lymphatics to the lungs and produce more or less clogging of the tissues with debris. These vertebral lesions are usually lateral.

In scrofula lesions will be found to the lymphatic glands impairing their innervation and function. The treatment is not to be applied over the glands directly. First it is nec-

essary to locate the lesions in the bones, ligaments and muscles or such tissues that would cause disturbances to the glands; then readjust the tissues. The object of the treatment is to modify the soil conditions on which the bacilli multiply by correcting the local derangements of the tissues. The entire body is not in such a depraved state that the bacilli will grow and multiply wherever they happen to come in contact with the body; certain tissues of any organ favor a receptivity for the bacillus, only when these local tissues are in a depraved state. It is then our business to aid nature in relieving obstructed forces that are causing such an effect.

There are general measures which influence the tuberculous process. The diet of the patient should be nutritious. A diet of milk, butter-milk, egg albumin and meat juice will be probably found best, although many will be able to take ordinary food. The patient should be out of doors as much as possible. Fresh air and sunshine are very important factors to be considered. If circumstances are such it would be best for the patient to move to southern Florida, California or Colorado, where he may receive a maximum amount of sunshine and pure atmosphere with an equable climate. Even when the patient is greatly debilitated and weakened, insist upon him taking out door exercises or rides. Gymnastic and methodical breathing exercises are essential in widening and strengthening the chest. The skin should be kept active as well as all the excretory organs. Always make it as comfortable for the patient as possible.

In the April number (1899) of the Journal of Osteopathy, Dr. McIntyre, in an article on "Fat Food in Consumption," sums up the treatment for tuberculosis in the following words: "The treatment, then, for consumption should include rich, stimulating diet, proportioned to the digestive

power of the patient, containing an excess of fats in most digestible form, of which sweet cream, fresh butter and well-cured bacon are the best examples, and the free use of pure drinking water, coupled with the promotion of blood flow, respiration and elimination of waste by osteopathic means."

CHOLERA ASIATIC.

Synonyms.—Epidemic cholera; cholera algida; cholera maligna; cholera infectiosa.

Definition.—An acute specific infectious disease caused by the comma bacillus of Koch, and characterized by vomiting, purging, rapid collapse, and painful cramps.

Etiology.—The specific cause is the comma bacillus of Koch. It can only produce cholera by being taken into the stomach; and if the digestion is weak the bacillus will be carried on into the intestines, where it thrives in the alkaline medium. Normal gastric juice will always destroy it. Heat, filth, and moisture favor its production.

Predisposing Causes.—Localities near the sea-coast in a warm climate, the warm months, the intemperate and those debilitated by want of food, bad surroundings and overcrowding. Nervous depression or fear has a marked influence.

Modes of Infection.—Drinking water is the common medium through which the bacillus is introduced into the body. Vegetables that have been washed in the infected water, especially lettuces and cresses. In milk, fresh bread, meat, butter, in the clothing, or on the hands are ways of conveying poison. The disease always spreads along the lines of travel and is not to any extent conveyed through the air.

Morbid Anatomy.—The body is much emaciated and has the appearances associated with profound collapse. A post-mortem rise of temperature often occurs; also, muscular

contraction, such as movements of the lower jaw, various movements of the arms and legs, and rotations of the eyes. The tissues are dry owing to the draining of the liquids of the body. The blood is thick and dark. The liver and kidneys are enlarged from passive congestion, also, cloudy swelling and considerable fatty degeneration. The spleen is usually small. The heart is fatty; the left ventricle is contracted and the right distended with blood. The lungs are collapsed showing congestion and oedema at the base. The stomach contains turbid liquid resembling rice water, and the mucous membrane is congested. The mucous membrane of the intestines is congested and swollen, and filled with rice water fluid. Bacilli are found in the contents of the intestines in great numbers and also in the mucous membrane. When death occurs during reaction, the inflammatory changes are more marked.

Symptoms.—After an incubation period of from two to five days, the attack develops during which three stages can usually be recognized; the preliminary diarrhoea, the stage of collapse and the stage of reaction.

Stage of Preliminary Diarrhoea.—This is characterized by moderate diarrhoea which is usually painless. The stools are very frequent, odorless, alkaline in reaction, and usually presents the "rice water" appearance. There may be nausea, vomiting, headache, restlessness, depression of spirits, while the temperature usually remains normal. The duration of the stage varies greatly from a few hours to a week or longer.

Stage of Collapse.—The diarrhoea becomes profuse, liquid and resembles rice water. There may be griping or tenesmus, also painful muscular cramps. There is extreme thirst. Vomiting soon sets in, becomes incessant and assumes a rice water appearance, gushing from the mouth in

great quantities. The voice is husky; the pulse becomes extremely feeble; the surface is ice cold; the superficial temperature falls below normal while that of the rectum may rise to 103 or 104 degrees F. There is usually stupor or even coma, although consciousness may remain to the end. Death usually occurs during this stage. Duration from a few hours to twelve or twenty-four hours.

Stage of Reaction.—Warmth and color return and the secretions are re-established. The urine increases in quantity; the stools are less frequent; the heart's action becomes stronger, and the patient recovers. On the other hand the severe diarrhoea may return and the patient die in relapse.

Complications.—Diptheritic or catarrhal inflammation of the throat, bowels and external genitals are the most common. Pneumonia, pleurisy, suppurative parotitis, bronchitis, and erysipelas may develop.

Diagnosis.—*Cholera Morbus.*—This is always sporadic; the stools are bilious in character; usually a history of dietetic imprudence or exposure; no painful cramps in the legs and feet; absence of urinary suppression. In severe cases of cholera morbus a satisfactory diagnosis can only be made by a bacteriological investigation, for the clinical picture of true cholera and severe cholera morbus are identical.

Prognosis.—This is always uncertain. In the old, young, intemperate, and debilitated, it is very fatal. Cases of early collapse and very low surface temperature rarely recover.

Treatment.—*Prophylaxis.*—The preventive treatment of Asiatic cholera is of much more importance than the cure. Owing to strict quarantine measures that have been employed in the United States, the disease has not gained a foothold since 1873. If a proper sanitary system would be used in India the disease would certainly not be of such an endemic nature.

The isolation of the sick and a thorough disinfection will quite effectually prevent the spread of the disease. Particular attention should be given to disinfecting the stools and the linen of the patients. The vomitus and stools may be disinfected by mixing with them an equal part of a five per cent solution of carbolic acid; or a freshly prepared solution of chloride of lime of an equal volume may be used. Let the dejecta stand for some fifteen minutes and then empty it in a pit which is to be carefully covered. Be certain that these pits are not near any source of water supply. All drinking water should be boiled before using and errors in diet are to be carefully avoided, especially the eating of uncooked foods. All disturbances of the digestion are to be treated at once, for many times such disturbances are the starting point of an attack. Let no one but the attendants into the sick room. All dishes, soiled linen, etc., should be carefully disinfected after using them. After convalescence has been established keep the patient isolated for a week, still following out all preventive measures. After vomiting and discharges from the bowels, wipe the parts with a cloth wet with a solution of mercuric chloride (1:2000).

Treatment of the Attack.—Probably the most effectual osteopathic treatment in cholera would be a thorough, strong treatment of the abdominal splanchnics on either side to control the diarrhoea and abdominal pain, and to render the gastric juice more normal. For the vomiting strong inhibitory treatment at the fourth, fifth and sixth dorsals and of the vagi in the sub-occipital region. For the bowel discharges treatment of the lower three dorsals, the lumbar region and over the sacrum. These treatments should be repeated often to control the violent disturbance.

Small bits of ice or lavage will aid in relieving the vomiting. External applications of heat and a hot bath will be

very comforting to the patient. Irrigation of the bowel with warm water and soap is found a helpful measure. During the attack the patient should be in a recumbent posture and a regulated, liquid diet is to be administered.

Sub-cutaneous injections of saline solutions have been practiced when profuse serous discharges occur, causing the blood to become concentrated and absorption to take place from the lymph spaces. It is repeated until the pulse is considerable stronger. This process is entirely physiological.

THE BUBONIC PLAGUE.

Synonyms.—Oriental plague; black death.

Definition.—A specific contagious disease; characterized by high fever, inflammatory swelling of the lymphatic glands, a tendency to buboes or carbuncles, and haemorrhages. It occurs in epidemic form and chiefly in insanitary surroundings.

Etiology.—The specific germ was isloated by Kitasato during the epidemic at Hong Kong in May, 1894. It is a short rod rounded at the end and resembles the bacillus of chicken cholera. It is found in the blood, glands, and other viscera but in no other disease is it present. It enters the body by way of excoriations, through the respiratory, and digestive tracts. Unhygenic conditions are the predisposing factors. It has disappeared from Europe but still occurs in Asia, though rarely.

Symptoms.—After an incubation period of from two to five days the disease sets in suddenly as a rule. The temperature rises rapidly. There is early delirium, intolerable headache, intense pains in the back and limbs, extreme thirst, anorexia, occasionally nausea and vomiting, and sometimes haemorrhages. At the end of two or three days, if the patient lives through it, buboes appear, forming the

most marked and characteristic symptom of the disease. With their appearance the fever subsides, a profuse sweat occurs and the pulse falls. The inguinal and femoral glands are most frequently affected; the cervical and axillary less frequently. Resolution may occur in these glands or the process may go on to suppuration. In very severe cases they may become gangrenous. Carbuncles may also be present.

Diagnosis.—It has been mistaken for typhus fever. The intense prostration, the characteristic buboes, carbuncles, haemorrhages, extensive petechiae and absence of the characteristic eruption of typhus fever will serve to separate it from typhus fever.

Duration.—Death may occur on the second or third day or even within a few hours. The plague is said to be the most fatal of all diseases. In favorable cases the duration is about eight or ten days, although in cases of extensive suppuration recovery may be delayed on account of the slowly healing buboes and carbuncles.

Treatment.—It is claimed that the disease is largely preventive. By correcting hygienic defects and sanitary conditions the disease can be greatly checked. Isolation of the sick, disinfection of all dejecta, the room, clothing, utensils, etc., nutritious food, and antiseptic treatment of the abscesses are the special indications to be met. Particular care should be taken with the food and drink. The symptoms are to be met as they arise.

YELLOW FEVER.

Definition.—An acute infectious disease; characterized by a febrile course consisting of two paroxysms, jaundice, black vomit, suppression of the urine, and haemorrhages; and due to the action of a specific virus which as yet has not been isolated.

Etiology.—The specific germ of the disease has not yet been discovered. It is, however, agreed that the disease is undoubtedly due to a specific organism. The poison may be conveyed by fomites; and epidemics are usually due to the introduction of the poison by the patient affected, or through infected articles. Ordinarily it is disseminated through the air. The predisposing causes are a hot climate, long continued high temperature, unhygienic conditions, bad drainage, overcrowding, intemperance and physical exhaustion. It usually prevails near the sea coast. More men are attacked than women. A previous attack or long residence in a locality in which it is endemic acquire immunity. Freezing weather renders the germ inactive, but does not kill it, and it is revived by return of warm weather.

Morbid Anatomy.—There is more or less jaundice and haemorrhagic extravasations under the skin. The blood serum is red-tinted owing to the destruction of the red cells. The liver is pale and presents extensive fatty degeneration with necrotic masses in and between the cells. The gastro-intestinal mucous membrane is swollen, congested and presents numerous minute haemorrhages. The kidneys show parenchymatous inflammation. The spleen is not enlarged. The heart sometimes shows fatty degeneration. The stomach contains more or less of the "black vomit" which is a mixture of transuded serum and transformed blood pigments.

Symptoms.—The incubation period varies greatly from a few hours to a week or more. The onset is sudden, usually without preliminary symptoms. The attack generally begin with a chill, followed at once by headache and pains in the loins and legs. The fever rises rapidly to 102 or 105 degrees F. The pulse is accelerated, the face is flushed, the tongue is coated, the throat sore, the bowels constipatd, and the urine scanty and albuminous. Nausea and

vomiting may be present at the onset, but becomes more severe about the second or third day when the black vomit appears. This febrile stage or stage of invasion lasts from a few hours to several days and is followed by a decline in the fever when the severity of the other symptoms abate. This is called the stage of remission and in favorable cases convalescence sets in or the patient may pass into the second febrile paroxysm. The temperature rises again, jaundice appears rapidly, nausea and vomiting return. The tongue becomes dry and coated. The stools are black and offensive, the urine is albuminous, scanty and may be suppressed, there may also be haematuria. Death may occur from exhaustion or from uraemia. Recovery may follow the gravest symptoms, even when there has been black vomit. The duration of the entire attack covers about one week. Relapses sometimes occur.

Diagnosis.—Remittent fever has not the deep jaundice, the clear mind, the black vomit, or the albuminaria of yellow fever. The enlarged spleen and the presence of the organism of Laveran in the blood in remittent fever will dcide the diagnosis.

In acute yellow atrophy of the liver, the liver is diminished in size, insiduous onset, marked cerebral symptoms, while leucin and tyrosin are present in the urine.

Prognosis.—This is always a grave disease, and in its severe forms very fatal. Recovery, however, may occur after the severest symptoms have been manifested. Black vomit is not always a fatal sign.

Treatment.—Prophylactic treatment should be carefully carried out. All patients should be quarantined and disinfection of all belongings must be rigidly enforced. People that are not acclimated should especially keep away from infected districts. Prevention of the dissemination of the poison by fomites should be carefully watched. Prevent-

ive treatment is summed up in the three words—isolation, disinfection and depopulation.

The treatment on the whole is symptomatic. The chills and fever of the first stage probably could be controlled by thorough work at the upper cervical, upper dorsal, lower dorsal and lower lumbar regions. Treatment at these points control the superficial and deep vascular areas of the body through the vaso-motor nerves. The irritable stomach, delirium and severe neuralgic pains of the head, back, epigastrium and limbs are to be treated according to the conditions and severity of the symptoms. The kidneys and bowels should be watched carefully. Hydrotherapeutic measures, as a cold bath or sponging may be employed to aid in controlling the fever, the nervous symptoms, and the eliminative power of the excretory organs. Discontinue the use of hydrotherapy when a spontaneous fall of temperature occurs.

At the beginning of the first stage and during the stage of remission are the periods that I believe the osteopath could do very effectual work by paying particular attention to the four large vascular areas of the body, viz: head, lungs, abdomen and legs. Treat the vaso-motor nerves to these regions, thoroughly, as given in the treatment of the first stage. During the third stage everything should be done that is possible to support the system. Feed the patient rectally if the gastric irritability is great. Ice slowly dissolved in the mouth will be of aid to an irritable stomach. Haemorrhages and the various symptoms are to be treated as they arise.

On the whole the indications are to keep the patient quiet in bed and to treat the symptoms as they occur. Good nursing, dieting, ventilation, and keeping the skin, kidneys and bowels active are the primary points to consider. The

diet should be a light liquid one of the nature of peptonized milk or light broths.

HYDROPHOBIA.

Synonyms.—Rabies; lyssa.

Definition.—An acute infectious disease of dogs and kindred animals and communicated by inoculation to man.

Etiology.—The disease is most frequently found in the dog, wolf and cat, however all animals are susceptible. The special agent of the disease has not yet been discovered, but it most probably is of microbic origin. The poison is contained in the saliva and blood. The virus enters the body through the broken skin and not through the mucous membrane. Bites on the face, head or hands are more apt to cause the disease than injuries on other parts of the body.

Morbid Anatomy.—The chief lesions are found in the cerebro-spinal system. The blood vessels are dilated and congested and there is cell infiltration of the perivascular lymph sheaths; this is especially intense in the medulla. The adjacent tissues are infiltrated with leucocytes and there are small haemorrhages. The virus is abundant in the spinal cord and brain. The fauces, pharynx, trachea and oesophagus may be markedly congested.

Symptoms.—The incubation period varies greatly, generally from six weeks to two or three months. Even two years has been stated to have elapsed before the symptoms develop.

Three stages are recognized:

The first or *premonitory stage.*—Depression of spirits, restlessness, headache, loss of appetite, the voice is hoarse and husky, darting pains or numbness at the seat of the bite, slight difficulty in swallowing, and increased sensibility occurs. There is a feeling of intense anxiety and a constant sense of impending danger. This lasts a day or two and is

followed by the second state or *stage of excitement.* The patient wears an expression of intense anxiety, is very restless and there is marked hyperesthesia. Clonic convulsions particularly affecting the muscles of the larynx and mouth, are exceedingly painful and may be so strong as to excite urgent dyspnoea. These spasms may occur spontaneously or are caused by drinking water. It is this fear of causing a spasm of the larynx which makes the patient dread the very sight of water. It is this symptom that gives the name hydrophobia to the disease. The paroxysm may be associated with manical excitement. In the interval between the paroxysms the patient is generally free from excitement. The temperature may rise to 100 or 103 degrees F.; while the pulse is frequent and sometimes irregular. This stage lasts from one to three days and is followed by the *paralytic stage.* The patient has become exhausted; the spasms no longer occur; there is unconsciousness or coma. This lasts from six to eighteen hours, the heart's action gradually becoming feebler and the patient dies by syncope. In man there is a form called "dumb rabies" in which the paralysis begins near the part bitten and extends over the whole body.

Diagnosis.—The history of recent infection will readily decide the dignosis. Hysteria in persons who have been bitten may simulate hydrophobia. The condition, however, generally passes away.

Prognosis.—Few cases, if any, recover if the disease is allowed to develop. Preventive treatment is often very successful.

Treatment.—Prophylactic treatment is considered the only treatment of any importance. When the disease has become established it is hopelessly incurable.

As soon as bitten the person should perform suction of the wound with the mouth if possible. Then as soon as

available the wound should be disinfected, followed by thorough cauterization with caustic potash or concentrated carbolic acid. The wound should then be kept open for four or five weeks and a prophylactic inoculation carried out. The Pasteurian anti-rabic inoculation is of great importance and should be followed as a precautionary measure. Keep the patient in a dark room and carefully attended. If the patient cannot swallow readily, nutrient enemata should be administered. The attendants should be cheerful and try to relieve as much of the patient's anxiety as possible.

ANTHRAX.

Synonyms.—Contagious carbuncle; splenic fever; charbon; malignant pustule.

Definition.—An acute infectious disease particularly affecting cattle and sheep but also occurs in man; and is caused by the bacillus anthracis. It is more prevalent in Europe and Asia than America, and especially in Russia and Liberia.

Etiology.—The infectious agent is the bacillus anthracis or its toxin. The disease in man always results from infection through slight abrasions or wounds in the skin, the intestines (with food), or in rare cases through the lungs. Direct inoculation by the bites and stings of insects sometimes occurs. Those most frequently affected are persons who come in direct contact with the affected animals as herdsmen, shepherds, butchers and stable hands; also those who handle the hides or hair of such animals, as wool sorters and the like.

Morbid Anatomy.—After death rigidity is marked. The blood is dark and thick and remains fluid for a long time after death. The spleen is greatly enlarged, sometimes to three or four times its normal size. When the intestines

are involved the bowel shows haemorrhagic infiltration and gangrenous patches. The nervous tissues show analogous lesions.

Symptoms.—Two chief groups are distinguished. External anthrax or malignant pustule, and internal anthrax, of which there are two forms. intestinal and pulmonary. The period of incubation is from three to seven days.

External Anthrax or Malignant Pustule.—The point of infection occurs most frequently upon the exposed parts—hands, arms, face, and neck. A small papule first appears at the point of inoculation and soon develops into a vesicle which is filled with clear or at times bloody serum. Inflammatory induration extends around this and at a little distance a number of small vesicles appear. Within thirty-six hours a dark brownish eschar makes its appearance. The brawny oedema spreads rapidly and there may be great swelling of the parts. The neighboring lymph glands are swollen and inflamed and inflammation may extend along the lymphatics.

To these local symptoms severe general disturbances are added, such as fever, thirst, prostration, sweats and frequent pulse. The liver and spleen are enlarged, the breathing rapid and in unfavorable cases collapse develops, and death may occur in from three to five days. In favorable cases the oedematous swelling subsides, the vesicles dry up and the scab is cast off.

Anthrax Oedema.—This form occurs in the eyelids, passing to the head, hands and arms which are the seat of extensive oedema. The color of the skin is not changed and the papule and vesicle do not form. The oedema may be so intense that gangrene results. In this form the local symptoms follow rather than precede the constitutional symptoms.

Internal Anthrax.—Intestinal Form, Mycosis Intestinalis.—The infection in this form is through the stomach and intestines. It is the result of eating the flesh and drinking the milk of diseased animals. It is often ushered in with a chill, followed by nausea, vomiting, moderate fever, bloody diarrhoea and abdominal pains. Pustules may form on the skin and haemorrhages may occur in the mucous membrane. Dyspnoea, marked cyanosis, restlessness, anxiety and sometimes convulsions or spasms of the muscles may occur in acute cases. The spleen is enlarged.

Wool-sorters Disease.—This form occurs in large establishments where wool or hair is sorted, especially that imported from Russia and South America. The infection is inhaled or swallowed with the dust. It begins with a chill, the temperature rises to 102 or 103 degrees F., pain in the back and legs, dyspnoea, bronchitis and cough, and the pulse is feeble and rapid. This form may prove rapidly fatal, death occurring in some cases within twenty-four hours with symptoms of profound collapse. Other cases are more protracted, vomiting, diarrhoea, delirium, convulsions or coma may occur. In some cases the brain may be chiefly involved and its capillaries are filled with bacilli.

Diagnosis.—In most cases of external anthrax the diagnosis is easily made from the character of the symptoms in connection with the history of exposure to the disease. Examination of the fluid from the pustules and the presence of the bacilli will decide the diagnosis.

Internal anthrax is more difficult to recognize unless the history or knowledge of the occupation of the patient points definitely to exposure to the infection.

Treatment.—The treatment generally recommended in malignant pustule is to destroy the point of inoculation by caustic or by the hot iron and then sprinkle the exposed surface with powdered mercuric chloride. The object of

such treatment being to destroy the mass. Some claim that if the pustules are small excision would probably be better. To prevent the extension of the brawny oedema about the site of inoculation injection several times a day of a solution of carbolic acid at points around the pustules is considered the best treatment. I believe it is also a good plan to manipulate the innervation and blood supply to the affected area. Nourishing food and attention to the general health is necessary in all cases. Preventive treatment in all cases should be considered. Animals that have died from the disease had better be cremated.

For internal anthrax little has been done, general measures have been used but are usually hopeless. Osler advises active purgation at the outset with a view to removing the infecting material.

TETANUS.

Synonyms.—Lock-jaw; trismus; cephalic tetanus.

Definition.—An infectious disease of the nervous system; characterized by persistent tonic spasms of the muscles with violent exacerbations.

Etiology.—The exciting cause of tetanus is a specific bacillus which usually gains access to the system through some wound.

The disease is much more prevalent in some localities than in others. It is found in hot countries, as in India and the West Indies, far more common than in temperate regions. Dark skinned races are more subject to the disease than the Caucasian race. Exposure to damp cold is one of the recognized causes, also in those localities where there are marked alterations of heat and cold. Such regions produce conditions favorable to the existence and growth of the bacilli.

Earth mould, particularly where putrefaction is taking

place, as in soil that has been manured, is especially favorable to the existence of the bacillus. Spores are probably carried by the air. This would answer why tetanus occasionally prevails in epidemics.

Wounds and abrasions of various kinds, particularly contused and punctured wounds of the hands and feet, favor the excitation of tetanus. When an open wound is present the term traumatic tetanus is given to the disease; idiopathic tetanus when no wound is discoverable; tetanus neonatorum when it attacks infants, this form is usually due to insanitary conditions, especially not properly taking care of the umbilical cord; lock-jaw or trismus when the jaw alone is affected; cephalic tetanus when the throat and face is involved.

Morbid Anatomy.—Characteristic lesions have not been found in the cord or in the brain. The condition of the wound is not constant. The bacilli develop at the sight of the wound where the toxin is manufactured. The bacilli do not invade the blood and organs. The tox-albumin is one of the most virulent poisons known.

Congestion occurs in various organs due to impediment of the movement of the blood during a spasm. The brain, cord, lungs and muscles are markedly congested. The nerves are often found injured and swollen. Peri-vascular exudations and granular changes occasionally occur in the nerve cells.

Symptoms.—The period of incubation is from ten to fifteen days. In some cases the incubation may be shorter or longer than ten to fifteen days. A chill precedes other symptoms in a few cases. The onset is quite sudden with stiffness in the neck, jaw and tongue. Opening the mouth is executed with some difficulty but it is not painful. Deglutition is difficult. The stiffness increases and extends to the spinal muscles, abdomen and legs which are held in a

firm spasm. Thus the entire trunk and legs are inflexible; orthotonos has occurred.

These symptoms vary in degrees of severity, dependent upon the extent of involvement. The jaws may be firmly locked or they may yield to forced extension, "lock-jaw." The muscles of the face may be involved, the angle of the mouth drawn out, and the eye-brows raised, "risus sardonicus." The neck and trunk muscles affected produce "opisthotonos." Spasms of the pharynx and oesophagus may occur, especially when there are injuries to the fifth nerve.

Associated with these tonic convulsions is intense pain. The distress of the patient is extreme when the chest muscles are affected. All symptoms are increased during the paroxysm. A foot fall, the slamming of a door, a draught of air or any slight sensory impression may excite a paroxysm. The paroxysm may relax and during the meantime the patient may walk about. The spasms vary in frequency from a few minutes to one in several hours. During spontaneous or induced sleep the spasm usually ceases. The febrile reaction is usually slight and apparently of nervous origin, in many cases 102 degrees F. In some cases it is said to reach from 108 to 110 degrees F. Perspiration is excessive. The urine is scanty and high colored. The bowels are usually constipated. The mind remains clear throughout. Death is generally caused by exhaustion.

Diagnosis.—The history of a wound followed by the characteristic symptoms would rarely occasion an error.

Strichnine poisoning differs from tetanus in the history, in the more rapid development of the symptoms, no trismus at the beginning, marked involvement of the extremities, and absence of rigidity between the paroxysms.

In tetany the extremities are chiefly affected by the

spasms, the muscles are relaxed during intervals, and trismus is a late or very rare condition.

In hydrophobia trismus does not occur and the respiratory spasm is caused by attempts at swallowing. The mental symptoms increase.

Prognosis.—The prognosis is unfavorable. The prognosis in children is more favorable than in the adult. Cases that are fatal usually die within six days. In cases where there is slight elevation of temperature, and in cases where the spasm is localized to the muscles of the face, neck and jaw, are more likely to recover.

Treatment.—The patient should be put in a dark room and there remain as quietly as possible. All sources of peripheral irritation should be avoided. Liquid food is to be given and if the jaws are firmly set rectal feeding may be employed or food may be passed through the nose with a catheter.

Local treatment of the wound is necessary; excision and antiseptic treatment should be employed. For the spasms, strong inhibition of the nerve centers controlling the affected muscles may be of use. Probably the most effectual treatment for the paroxysms would be strong thorough treatment of the upper cervical region. All the excretory organs should be greatly stimulated, particularly the kidneys, lungs and bowels. Other symptoms are to be treated as they arise.

GLANDERS.

Synonyms.—Farcy; malleus humidus.

Definition.—An infectious disease of the horse occasionally transmitted to man; and caused by the bacillus mallei. It is characterized by nodular growths; when these form in the nares it is known as glanders; when under the skin it is called farcy.

Etiology.—The specific organism which causes the disease is the bacillus mallei. It is short, non-motile and resembles the bacillus of tubercle. Man may become infected by contact with diseased animals; the medium of conveyance being either the pus or the nasal secretions; and usually by inoculation in a wound, however slight in the skin or mucous membrane.

Morbid Anatomy.—The characteristic lesions are the granulomatous tumors which are usually nodular. These masses tend to soften and break down, rapidly forming ulcers when they occur on the mucous membrane and abscesses when they form beneath the skin. These nodular tumors seen under the microscope are composed of lymphoid and epitheliod cells and also the bacillus mallei.

Symptoms.—Both glanders and farcy may be either acute or chronic.

Acute Glanders.—The incubation period is three or four days. At the point of infection there is lymphangitis swelling and redness. Soon fever and signs of general disturbance appear. Within two or three days the nasal mucous membrane becomes involved. There is rapid breaking down of the nodules and a fetid haemorrhagic or mucopurulent discharge takes place. There is great swelling in the nose. The adjacent mucous membrane of the conjunctiva, pharynx and mouth, and sometimes of the larynx, lungs, bronchial, and gastro-intestinal tract may be involved. The ulceration sometimes goes on to necrosis. A papular eruption which quickly becomes pustular breaks out in the face, trunk, and extremeties, especially about the joints. This is sometimes mistaken for variola. Nosebleed is common and the lymph glands of the neck become swollen and sometimes suppurate.

Chronic Glanders.—This is a rare disease and one that is hard to recognize. The symptoms are those of chronic

coryza and often of chronic laryngitis. The diagnosis may necessitate the making of pure cultures and inoculation of a guinea pig. The animal perishes within thirty hours; the testicles are even then swollen and suppurating.

Acute Farcy.—At the point where the virus has been inoculated into the skin a nodular swelling or an ulcer appears. The symptoms may simulate those of acute pyaemia. The lymphatics are affected early and nodular subcutaneous enlargements appear along their course; these are the so-called farcy buds which rapidly suppurate. The nose is not affected and the papular eruptions seldom appear.

Chronic Farcy.—Localized tumors especially in the extremities form under the skin which break down forming abscesses or sometimes deep ulcers. The process is quite slow and the lymphatic glands are not involved.

Prognosis.—There is little hope in the acute forms of either farcy or glanders. In the chronic form recovery is possible though generally very tedious.

Treatment.—The primary lesion of the disease should be treated surgically. When seen early the wound should be cut out or destroyed thoroughly by caustics and dressed antiseptically. The general health is to be carefully taken care of by correct feeding and proper hygienic surroundings. The farcy buds should be opened early.

FOOT AND MOUTH DISEASE.

Synonyms.—Epidemic stomatitis; aphthous fever.

Definition.—An acute infectious disorder affecting the lower animals, especially cattle, sheep and pigs. It is characterized by the appearance of vesicles and ulcers in the mucous membrane of the mouth, about the feet and on the udder. The disease spreads rapidly and causes very serious losses.

Etiology.—It can be quite readily communicated to man by means of milk, butter and cheese. Contact with the fluid from the vesicles or with the saliva from the affected animal will also communicate the disease.

Symptoms.—After an incubation period of from three to five days the disease sets in with a rigor or slight shiverings, followed by fever, malaise, loss of appetite; and vesicles soon develop upon the lips, tongue, the buccal and paryngeal mucous membrane.

Haemorrhages sometimes occur. The mouth is hot and the swelling may be so great as to make speech difficult. There is copious salivation. Vesicles almost immediately appear between the fingers and toes and around the nails, sometimes on the skin surface of different parts of the body.

Prognosis.—As a rule the disease runs a favorable course. The duration is about one week.

Treatment.—In epidemics prophylactic measures should be observed. The diseased animals should be isolated and all milk should be boiled. Observe hygienic rules. See article on apthous stomatitis.

LEPROSY.

Synonym.—Lepra.

Definition.—A chronic infectious disease due to the bacillus leprae; characterized by constitutional depression, by the presence of tubercular nodules in the skin and mucous membrane, or by similar infiltration of the nerves.

Etiology.—The special agent has been proven to be the bacillus leprae discovered by Hansen in 1880. The disease is contagious but spreads exceedingly slowly. The disease attacks all classes and persons of all ages but is most frequent between twenty and forty years of age. Hereditary

influences predispose to the disease. The disease is transmitted by contact, inoculation by sexual intercourse, and also by vaccination.

It is almost unknown in Europe except in Norway and the Orient. In this country it exists in the Gulf States and extensively in Mexico. A few cases exist among the Norwegians in the Northwestern states. In the Sandwich Islands, West Indies, Palestine, Egypt, India, China and Siam, leprosy is still endemic.

Morbid Anatomy.—In tubercular leprosy the tubercles consist of granulomatous masses surrounded by a layer of connective tissue. There are nodular outgrowths in the skin of intervening areas of ulceration or cicatrization. The mucous membranes are also involved; this is especially true of that of the eyelids, cornea, conjunctiva and larynx. The lymphatic glands, the liver, the spleen, but rarely the blood, are affected by the bacilli. In aneasthetic leprosy the bacilli develop in the nerve fibres. At first this causes irritation and pain, but later atrophy and anaesthesia is produced.

Symptoms.—Two forms are recognized, tubercular and anaesthetic.

Tubercular Leprosy.—At first there is often an erythematous redness of the skin in places with hyperaesthesia. Some of the places become pale, others are of a brownish tinge. The name macular leprosy is sometimes given to this form. In some cases this continues without the development of nodules; the pigment gradually disappears, leaving the areas perfectly white and anaesthetic—the lepra alba. In less favorable cases tuberculous nodules develop. These may remain for some time, but sooner or later they are either absorbed or break down and ulcerate. The mucous membrane of the mouth and larynx becomes involved. The cornea and conjunctiva may become involved to such an extent that blindness results.

Anaesthetic Leprosy.—At the onset there are pains in the limbs and areas of hyperaesthesia which later become anaesthetic. Minute bullae due to trophic changes appear early. The peripheral nerves become thickened and nodular due to infiltration with the leprous growth. Trophic phenomena are usually marked. Bullae of considerable size appear in the affected area which burst leaving perforating or destructive ulcers. Atrophy and wasting are liable to occur; and toes, fingers or even the larger limbs may drop off.

Diagnosis.—In the early stages the patchy erythema with hyperesthesia, later followed by areas of anaesthesia will make a diagnosis quite easy; while in the advanced stages it could not be mistaken for any other affection.

Prognosis.—It always runs a very chronic course. It is doubtful if recovery can ever take place, still the patient may live for many years in comparative comfort.

Treatment.—The treatment of leprosy has not been a success. It is a question as to what osteopathic treatment could do in such cases. Undoubtedly attention to the general health of the patient with special care of the locality affected would accomplish something. Segregation should be practiced whenever possible.

ACTINOMYCOSIS.

Synonyms.—Big-jaw; bone tumor; lumpy jaw; swelled head.

Definition.—An infectious and inflammatory disease of cattle, to a lesser extent of man, produced by the actinomyces or ray-fungus.

Etiology.—The organism belongs to the *Cladothrix* group of bacteria and is seen in the pus from the affected region. The infection is most probably taken in with the food and drink; or less frequently it enters by way of the air passages or the skin. A wound in the mucous membrane or skin is

necessary before the poison can enter. The disease is rare in this country and England, but quite common in Germany and Russia.

Morbid Anatomy.—At first the parasite produces a small granulatous tumor. Soon threads of mycelium radiate in all directions, giving a ray form of growth. Suppuration finally occurs.

Symptoms.—The favorite seat of the infection is the carious teeth from which the jaw is invaded and become swollen. The first symptoms being toothache, dysphagia and difficulty in opening the mouth. At first there may be swelling of one side of the face or an enlargement at the angle of the jaw which may be mistaken for an osteo-sarcoma. The tongue, fauces, intestines and liver may be invaded, but more rarely. The lungs are also frequently the seat of the disease, causing a chronic disorder of the lungs. The characteristic symptoms are fever, cough, a peculiar, more or less fetid expectoration, general wasting, and pain in the side. A careful examination of the sputum usually reveals the presence of the fungus. This form resembles pulmonary consumption; the average duration is ten months.

The skin is rarely affected. It is a very chronic affection and consists of suppurating ulcers in which the ray-fungus has been found. Primary actinomycosis of the brain has occurred; or the primary seat of the infection may be the upper jaw from which the base of the skull is perforated, the disease then attacks the brain.

Diagnosis.—Sarcoma of the jaw resembles actinomycosis. The recognition of the fungus will alone decide the diagnosis. It is often mistaken for pyaemia of which in reality it is a chronic form. The diagnosis must rest solely upon the presence of the actinomyces in the pus.

Treatment.—The treatment is largely surgical, consisting of the removal of the dead bone and opening of the ab-

scesses. All infected parts should be thoroughly extirpated and the region drained and disinfected.

SIMPLE CONTINUED FEVER.

Synonyms.—Febricula; ephemeral fever; irritative fever; gastric fever; synocha.

Definition.—An acute febrile disease, mild in character, of slight duration, not excited by any special organism and depending on a variety of irritating causes. A true ephemeral fever lasts about twenty-four hours. If it persists from three to six or more days without local affection it is termed simple continued fever or febricula.

Etiology.—The most frequent cause of this form of fever is probably gastro-intestinal disturbances. In children it may consist of gastro-intestinal catarrh or it may take the form of indigestion, due to exposure to cold or to the eating of decomposing substances; or in cases of longer duration it may be due to the absorption of toxic substances. It may follow exposure to the sun or great heat or cold; or mental or physical fatigue. It may be the result of exposure to cold sufficient to produce a slight bronchitis, tonsilitis or other affections producing an unnoticed localized inflammation. It may follow a prolonged exposure to noxious odors or sewer gas.

Symptoms.—The disease usually sets in abruptly with a feeling of lassitude, weariness, chilliness, headache, loss of appetite and furred tongue. The urine is scanty and high colored. The temperature rises quickly to 102 or 103 degrees F. or over; and is usually apt to terminate suddenly by crisis on the third or fourth day. The pulse is frequent and the face is flushed. Herpes on the lips are common. Mild delirium may occur. Anorexia is present, and the bowels are constipated. The disease lasts from a few days

to two weeks and may end by crisis or lysis. Convalescence is rapid.

Diagnosis.—This generally rests upon the absence of local manifestations especially the characteristic skin eruptions. If the fever cannot be attributed to some of the causes already referred to, there may be a doubt as to its character for the first twenty-four hours. But if after a careful examination one finds no other cause and no symptoms develop of any of the recognized diseases, acute continued fever can hardly be mistaken for any other disease.

Prognosis.—Always favorable, recovery without sequelae being the rule.

Treatment.—It is necessary to find out the irritative cause in order for one to be able to treat intelligently. Too great care can not be taken in finding out the cause of disease; when finding out the real cause of the disorder the case is nearly half cured; the remainder of the work can then be executed with exactness.

Rest in bed with treatment of the disturbing factor of the disease, whatever that may be, is the principal treatment to be given. Careful examination of all the organs with due consideration of the symptoms will generally leave no doubt as to the cause; and treatment applied accordingly will be quite sufficient. If there is any gastro-intestinal disorder, thorough treatment of the splanchnics, anterior treatment to the abdomen and thorough evacuation of the bowels is indicated. Use an enema if necessary. Besides the usual fever treatment, sponging the body with tepid water at the time of day when the fever is highest will aid in lessening the temperature and rendering the patient much more comfortable. In cases where nervous symptoms are prominent care should be taken against any excitation that may occur; and if insomnia results a quieting treatment in the cervical region is usually quite sufficient. Use plenty of water in-

ternally which is not only necessary for the tissues on account of the fever but it is of great aid in keeping the skin and kidneys active; and thus a great help in the elimination of waste material. A liquid nutritious diet is best. Milk, soups and broths will be quite enough. The demands on the digestive tract are not great when a light diet is administered, besides not exciting the nervous and vascular systems unduly.

WEIL'S DISEASE.

Synonym.—Acute febrile jaundice.

Definition.—An acute febrile disease; characterized by fever and jaundice.

Etiology.—It is probably a specific disease. The summer months, males, age between 25 and 40 are predisposing causes. Laborers, butchers and weavers seem to be especially predisposed. Cases nearly always occur in groups.

Symptoms.—The onset is abrupt, usually with a chill and without prodromes. This is soon followed by fever, headache, pains in the back and sometimes agonizing pains in the legs and muscles. Jaundice usually appears early and may be slight or very marked. The stools are clay colored, characteristic of obstructive jaundice. The fever is of the remittent type lasting from ten to fourteen days. The liver and spleen are usually swollen and tender. Gastro-intestinal symptoms are seldom present. Vomiting, diarrhoea and coated tongue may be present but are rare. Delirium, convulsions and coma are of grave but rare symptoms. The urine is high colored, febrile, generally containing albumin, sometimes casts and blood.

Prognosis.—The prognosis is good. A few fatal cases have been recorded. No definite morbid changes have been found.

Treatment.—The treatment is symptomatic.

MILK SICKNESS.

Synonyms.—Trembles; puking; slows.

Definition.—A peculiar infectious disease; characterized by constipation, vomiting and trembling. The disease prevails throughout the western and south-western states and is quite unknown east of the Alleghany mountains.

Etiology.—The disease occurs in cattle and is communicated to man by means of the diseased milk or its products. The butter and cheese and also the flesh are poisonous. Cattle, horses, sheep and goats are especially attacked. Late summer and autumn and adult life are predisposing factors.

No peculiar morbid changes have been found.

Symptoms.—After two or three days of languor, uneasiness and distress the disease is ushered in abruptly with epigastric pains, nausea, vomiting, constipation, moderate fever and excessive thirst. The tongue is swollen and tremulous and the breath has a peculiar fetor. Restlessness, stupor which may deepen into coma, and convulsions may supervene and the patient pass into a fatal typhoid state.

The duration is from two to ten days or longer. Fatal cases terminate in two or three days. In favorable cases convalescence is extremely slow.

Prognosis.—The prognosis is generally favorable.

Treatment.—Prophylactic measures are quite necessary. This consists in isolating affected animals and avoiding the use of infected food and drink. The treatment is said to be symptomatic.

MALTA FEVER.

Synonyms.—Mediterranean fever; rock fever; neapolitan fever.

Definition.—An acute infectious disease; characterized by periods of remissions which gradually lengthen from a few

days to a month or six weeks. These remissions occur at intervals of from three to six weeks. The periods of apyrexia gradually shorten as the remissions lengthen.

Etiology.—This disease is probably due to the micrococcus melitensis. Young persons are most frequently attacked. No characteristic morbid lesions have been found.

Symptoms.—After an incubation period lasting from five to ten days the onset is gradual with headache, sleeplessness and loss of appetite. There is thirst without shiverings, diarrhoea, spots or high fever. These symptoms last three or four weeks when the first remission sets in resembling true convalescence. In a few days this is followed by a relapse; this time with rigors, intense headache and fever, sometimes diarrhoea. This relapse lasts five or six weeks to be again followed by a remission of ten days to two weeks. This is again followed by a relapse; all the symptoms of the first relapse recur with the addition of great debility, night sweats, pains in the hips, knees, ankles and elbows, also in one or both testicles. The third remission sets in, which may last for a month or six weeks. All the former symptoms appear in the third relapse with the addition of extreme debility, thickly coated tongue, and temperature as high as 105 degrees F., which is worse in the night but normal in the morning. There is also involvement of all the joints and the night sweats are marked. All movements are attended by agonizing pain. Often the fibrous structures, especially the tendo-archillis, and the fibrous structures around the ankle joint, also the lumbar aponeurosis and sheaths of the nerves of the sacral plexus, are involved.

The duration is variable, some cases lasting as long as six months. The mortality is not great.

Treatment.—The patient is to be carefully guarded against exhaustive effects of the disease. The strength of the patient is to be maintained by nourishing fluids. Hydrothera-

peutic measures are of aid in reducing the fever. On the whole it is claimed that the treatment is symptomatic.

MILIARY FEVER.

Synonym.—Sweating sickness.

Definition.—An infectious disease; characterized by copious sweats, an eruption of miliary vesicles and by fever.

Etiology.—The specific cause has not been found; and there has not been any definite morbid lesions discovered as yet. Most epidemics occur in the spring and summer. More women are affected than men, and it occurs most frequently during the middle period of life. All persons in an affected district are liable to be attacked. Of late years the disease has been almost entirely confined to France and Italy.

Symptoms.—In mild cases the fever is slight. There is profuse sweating, loss of appetite and an eruption of miliary vesicles. In severe cases delirium, high fever, and haemorrhages followed by fatal collapse may occur.

The duration is usually from six to eight days; sometimes as long as three or four weeks. Relapses are not uncommon.

Prognosis.—This varies greatly in different epidemics. The death rate at the onset of the disease is generally high.

Treatment.—The condition is to be treated as it arises. Attention to the symptoms as they occur and correction of the disorders found will be necessary as the disease varies considerable in severity. Usually attention to the fever and the use of warm baths and sponging are necessary in addition to the symptomatic treatment.

SECTION IV.

CONSTITUTIONAL DISEASES.

ACUTE ARTICULAR RHEUMATISM.

Synonyms.—Rheumatic fever; inflammatory rheumatism.

Definition.—An acute febrile non-contagious disease; it is probably infectious, although its exact nature is not known; characterized by a multiple arthritis and a marked tendency to involve the heart.

Etiology.—No specific microbe has yet been found; it is considered to be an infectious disease and it occurs in epidemic form. The disease is most prevalent in the temperate zone and is almost unknown in cold or tropical latitudes. It prevails most extensively during the spring months. Acute rheumatism results from an interference with the nerve centers by damp and cold. Defective metabolism is thus produced; the nitrogenous products instead of being converted into urea forms lactic acid which accumulates in the system and causes the disease. Sometimes the lesions are trophic in character. According to the metabolic theory there is produced in the system a morbid material as a result of defective assimilation. Catching cold, heredity, occupations which require exposure to cold, wet, or sudden changes of temperature, early life (20 to 40), lowered vitality from overwork, improper food, fatigue, etc., and a previous attack are predisposing causes.

Morbid Anatomy.—There are little or no changes characteristic of the disease. Usually the synovial membrane is hyperaemic and swollen. The fluid is turbid, mainly serous, containing fibrin and sometimes leucocytes. There may be slight erosion of the cartilages. The blood generally contains an increased amount of fibrin. Acute rheumatism rarely proves fatal; when death does occur it is generally due to the complications which arise.

Symptoms.—The disease usually begins abruptly, although it may be preceded by slight fever, aching in joints,

malaise, chilliness, and sore throat. It generally involves the larger joints and is almost always multiple; it always has a tendency to fly from one joint to another. The pain in the joints usually develops rapidly with slight chilliness and a rapid rise in the temperature from 102 to 104 degrees F. The pulse is frequent, often disproportionately to the fever. There are profuse acid sweats often causing sudamina. There is loss of appetite and thirst is present. The urine is scanty, high colored, very acid, and deposits urates upon standing. The tongue is coated and the bowels are constipated. The joints are reddened, swollen, extremely painful and tender to the touch. Every movement, jarring of the bed, or the pressure of the bed clothes is agony to the patient. The blood is greatly deranged, anaemia develops rapidly, and there is well marked leucocytosis. The duration varies from a few days to several weeks.

Complications.—*Hyperpyrexia.*—The temperature may rise to 106 or 109 degrees F.; this is often associated with delirium, great prostration and a feeble, frequent pulse.

Endocarditis, pericarditis, myocarditis, pneumonia, pleurisy, iritis, chorea, convulsions and meningitis may occur. Coma may develop without preceding delirium or convulsions; this is very serious and may prove rapidly fatal. Subcutaneous fibrous nodules attached to tendons and fascia sometimes develop. They may vary in size and are most common in children and in young adults, occurring most frequently in the fingers, hands and wrists. They are also sometimes seen about the elbows, knees, scapulae and spines of the vertebrae. They usually last a few days, sometimes for months and generally develop during the decline of the fever. Cutanous affections, such as urticaria, erythema nodosum, purpura and sweat vesicles sometimes appear.

Diagnosis.—This is seldom very difficult; there are, however, several affections which closely resemble acute articular rheumatism.

Septic Arthritis.—Its associations with some other septic process and the tendency of the inflammation to end in suppuration with more or less destruction of the joints, will determine the diagnosis. Septic arthritis may develop during the course of pyaemia, puerperal fever, acute necrosis, or acute osteo-myelitis.

Gout.—This is rarely mistaken for acute rheumatism. Gout occurs later in life and usually affects the greater toe; history and mode of onset will render the diagnosis easy.

Gonorrhoeal Rheumatism.—The history of recent infection, its obstinate character and being generally connected with a single joint from the start are quite diagnostic. It especially affects the knee. Heart complications are rare.

Rheumatoid Arthritis.—This begins in the small joints; then attacks them all, leaving permanent deformity. There is no fever or sweats and the heart is not affected.

Acute Arthritis of Infants.—This usually attacks one joint (hip or knee). The effusion rapidly becomes purulent.

Prognosis.—Recovery is the rule, but the prognosis nevertheless, must be guarded. Relapses and recurrences are common.

SUBACUTE RHEUMATISM.

In this form both the local and general symptoms are of a milder type and are more prolonged than in the acute form. The fever rarely rises above 101 degrees F. The inflammation of the joints is not so severe and fewer joints are involved. It may be associated with endocarditis or pericarditis, especially in children. It may last for weeks or months, and then it may pass into the chronic form. Usually though, when the course is prolonged, the joints return to their normal state.

Treatment.—Place the patient in a room that is well ventilated and maintain a temperature of about 70 degrees F. Carefully avoid draughts of air. The bed should be soft and smooth and blankets should be used. The diet of the patient should consist principally of milk. Oat-meal, barley water, egg albumin and meat juices may also be used.

Treatment should be given along the entire spine, especially if the rheumatism changes from one joint to another; otherwise treat the innervation directly to the affected joint. Correct any derangements that may be found along the spinal column and carefully relax the deep back muscles. Particular attention should be given to the bowels and kidneys. Also, treat the liver most thoroughly during each treatment. I have seen the liver many times considerably enlarged and tender in rheumatism and a thorough treatment of it seemed to favor a more rapid cure.

Carefully treat the affected tissues. If you can not treat over the joint, then manipulate the tissues above and below the joint; and usually after a few minutes manipulation the swelling is somewhat relieved so that direct treatment of the joint can be given. It is best to wrap the inflamed joints in flannel and if the pain is severe, besides treatment of the innervation of the joint, hot applications will be helpful. Some claim that cold compresses are of aid to the inflamed joints.

Complications are to be treated separately. Besides the ordinary fever treatment for the fever, the cold bath is very effectual. After convalescence has been established the patient should be carefully protected for several days from cold and damp. For any stiffness that may persist, manipulation and hot baths will be quite sufficient.

CHRONIC ARTICULAR RHEUMATISM.

Definition.—A chronic inflammatory swelling of the articular structures, developing gradually and slowly, rarely following an acute or subacute attack.

Etiology.—This usually begins as a chronic affection and is most common among the poor, especially those exposed to damp and cold. Heredity, advanced years, although the disease may appear at any age, and constant exposure to cold and wet are predisposing causes. Chronic lesions to the spinal column corresponding to the affected area are commonly found.

Morbid Anatomy.—The capsules and ligaments of the joints are thickened, also, the sheaths of the tendons around the joint, so that in long standing cases the movements are impaired. In severe cases the cartilages may be eroded. Atrophy of the muscles covering the joints sometimes occurs, especially when there is neuritis; thus producing marked deformity. This muscular atrophy is particularly marked when the shoulder or hips are involved. The atrophy is caused partly from disease; in cases where the joint is distended with effusion, the wasting may be due to pressure upon the muscles themselves or upon the vessels supplying them.

Symptoms.—Several joints are usually affected; but it may be limited to one joint, particularly the knee, hip or shoulder. Pain and stiffness are the most common symptoms. The pain is increased upon motion, while the stiffness is often lessened by using the limbs. The joints are slightly swollen, but seldom reddened and are usually tender upon pressure. All the symptoms are aggravated on the approach of stormy weather. There is no fever and the general health is very seldom impaired. There may be distortion of the joints and ankylosis may occur. Arterial

degeneration and chronic endocarditis may develop as complications.

Prognosis.—This is very apt to be unfavorable so far as a complete cure is concerned; although most cases are greatly benefitted.

Treatment.—The treatment of chronic articular rheumatism is largely of the same nature as rheumatoid arthritis. Correcting lesions of the spinal column, which affect the diseased tissues and local treatment of the joints constitutes the essential treatment. The joints and limbs should be thoroughly treated so as to restore a better circulation and relieve the inflamed tissues. Wrapping the affected joint with cold cloths and then covering the cloths with flannel and oiled silk is quite helpful. Due attention should be given the general health.

ARTHRITIS DEFORMANS.

Synonyms.—Rheumatoid arthritis; rheumatic gout.

Definition.—A chronic affection of the joints; characterized by progressive changes in the cartilages and synovial membranes, and by new osseous formations restricting the motion of the joint and producing great deformity.

Etiology.—This affection is now conceded to be entirely independent of gout and rheumatism. It is most certainly of nervous origin, being due to lesions of the spinal cord which are either primary or secondary to peripheral irritation, the result of uterine or traumatic disease. This is based upon the fact that the disease is associated with nervous shock, grief, and worry; the symmetry of the joint deformities in the multiple form, the marked trophic disturbances that are usually associated, leading to alterations in the skin and nails, the muscular wasting, and the similarity of the arthritis to the arthropathies which are due to disease of the cord as in locomotor ataxia, etc. Lesions of the

spinal column, (vertebrae), are found corresponding to the innervation of the diseased joints. Females are more frequently affected than males. The disease is frequently seen in women suffering from ovarian and uterine troubles. Hereditary influence is also a factor. The disease is most common between the ages of 20 and 30. Mental worry, anxiety, grief and injury are also predisposing factors.

Morbid Anatomy.—The cells of the cartilages and of the synovial membrane proliferate. The cartilages undergo fibrillation, become soft, degenerate, and are absorbed, leaving the ends of the bone bare. The bones naturally atrophy, become smooth, polished and eburnated. The edges of the cartilages where the pressure is slight, thicken and form outgrowths which ossify and enlarge the heads of the bones forming osteophytes which greatly impair the motion; true anchylosis is rare. The synovial membrane becomes thickened, also the capsule and ligaments, thus greatly restricting the movements of the joints. The muscles around the joint atrophy. In the spinal cord, atrophic and degenerative lesions are found.

Symptoms.—*Multiple Arthritis Deformans.*—(a) *Heberden's Nodosities.*—In this form nodules develop at the sides of the distal phalanges. It occurs most frequently in women between the ages of 30 and 40, and gradually increases with age. At first the joints are swollen, tender and painful and then apparently become better. These attacks may appear at different intervals while the nodules at the sides of the joints gradually increase in size. The larger joints are rarely affected.

(b) *General Progressive Form.*—This may be either acute or chronic. The acute form at the onset may resemble articular rheumatism. It is more common in women between the ages of 20 and 30, but may occur in children. Pregnancy, recent delivery, lactation, the menopause, and rapid

child bearing are common antecedents. There is swelling and tenderness of the joints and slight fever. Several joints are usually involved.

The *chronic* form is most common. Symmetrical joints are usually involved. The affected joints slowly enlarge and are painful and red. Usually the hand is first affected; then the wrists, knees, toes, jaws and spine; in extreme cases every joint is affected. In some cases there is hardly, if any, pain, while in others the pain is agonizing and is almost constant. The joints gradually become deformed, stiff and creak when moved; later they become completely anchylosed. This deformity is due partly to the thickening of the capsule, to the presence of osteophytes, and to the contraction of the muscles. These contractures flex the leg upon the thigh and the thigh upon the abdomen; and are also seen in the upper extremity producing the "seal-fin" deflexion. Muscular atrophy increases the deformity. Numbness, tingling, pigmentation and glossiness of the skin, and local sweating may be present and are of trophic origin.

The Partial or Monarthritic Form.—This form affects old persons chiefly, and women more frequently than men. It affects particularly the hips, the knees, the shoulder, and the vertebral articulations. This is often caused by an injury. The muscles waste away and the knee jerk is usually increased upon the affected side.

A special form affects the vertebrae only (spondylitis deformans). The cervical spine may be alone involved, in which case the head can not be moved up or down, although rotation usually remains. In some cases the entire spinal column is affected and may become perfectly rigid.

Diagnosis.—This is rarely difficult and can seldom be mistaken for either rheumatism or gout. The atrophied shoulder of omo-neuritis may be sometimes mistaken for the mono-articular form; in the former there is pain, greater

tenderness, thickening of the capsule and of the ligaments, as well as the acuteness of the affection which will distinguish it.

Prognosis.—This disease is considered incurable, but seldom proves fatal. Some cases improve under treatment and in others the progress of the disease is arrested. It is gratifying to know that many cases will improve considerably under continued osteopathic treatment.

Treatment.—Osteopathic treatment, if long continued in rheumatoid arthritis, has given very satisfactory results, although owing to the direct cause of the deformity, a cure in advanced cases cannot be expected. The cause of the disease seems to be a trophic or vaso-motor disturbance to the tissues of the joint. Osteopathically, there is never any difficulty to locate disorders in the spinal column corresponding to the innervation of the tissues of the involved joints. The fact that many of the joints are affected symmetrically show that the lesion is a spinal one involving the nerve center.

The treatment consists of attempts to correct the spinal derangement and careful manipulation of the diseased joints to restore vitality and motion in them. The preceding simple, but effective treatment, must be continued two or three times per week for months or even years in order to be of any particular value. Coupled with the specific treatment should be a careful consideration of the general health. The emunctories should be kept active and the food of the patient should be nutritious. The physician should require the patient to take considerable physical exercise at regular intervals, warm baths and plenty of fresh air. Massage and friction of the diseased joints will be of aid in absorbing effusions and in restoring the tone of atrophied muscles. The baths at various hot springs are sometimes of aid.

GOUT.

Synonym.—Podagra.

Definition.—A nutritional disorder due to an auto-infection, accompanied by an abnormal accumulation of uric acid in the blood and tissues; characterized by attacks of acute arthritis and by gradual deposition of uratic deposits in and about the joints.

Etiology.—Hereditary influences are the predisposing factors of about one-half of the cases of gout. Men are more frequently affected than women. It rarely develops before the age of thirty. Overeating, drinking alcohol, especially fermented drinks, and lead poisoning are predisposing factors.

Gout is not confined to the rich by any means; but there is also a "poor-man's gout," due to poor food, unhygienic surroundings, and to an excessive use of malt liquors. Uric acid seems to be the causitive factor of gout, but whether there is an increased formation or a diminished excretion of the uric acid has not yet been decided. The ultimate result is the same in either case; there is an accumulation of uric acid in the blood which is responsible for the disease.

Osteopathic experience with cases of gout show that it is primarily an affection of the nervous system. The nervous system is undoubtedly the important factor that controls uric acid accumulation or excretion. The nerve centers controlling the affected portions of the body are apparently invariably involved. A neurosis of these nerve centers probably occurs and is thus the predisposing cause of gout. More can be accomplished in the cure of gout by careful examination of the spinal column in the region corresponding to the innervation of the affected area for vertebral lesions and their correction, than by any other method. Usually, slight dislocations of the bones of the

foot are found when that region of the body is involved. The most common dislocations of the foot are involvements of the astragalus with its articulations.

Morbid Anatomy.—In the first place there is a local necrosis in the articular cartilages. Here in this acid medium the neutral urates are deposited in minute crystalline masses as insoluble acid urates. This interstitial deposit begins with the first paroxysm, becoming thicker as the attacks are repeated. The first joint of the great toe is most frequently affected; then the ankles, knees, hands and wrists. The chalky concretions may also be deposited in the cartilages of the ears, nose, eyelids and larynx. The ligaments and fibro-cartilages become involved and are infiltrated with crystals of sodium urate. These sometimes ulcerate through the skin, especially the knuckles of the hands and the chalk stones appear externally. The joints become irregularly enlarged, stiff and ultimately anchylosed.

The kidneys are usually the seat of chronic interstitial inflammation and a deposit of urates are found chiefly in the region of the apices of the pyramids. The heart and blood vessels almost always present changes. Arterial sclerosis is quite a constant lesion; the left ventricle of the heart is hypertrophied. Urate of sodium has been found deposited upon the valves. Chronic bronchitis, emphysema and asthma are among the changes in the respiratory system.

Symptoms.—There are acute, chronic and irregular forms of gout.

Acute Gout.—Before the attack the patient may complain of dyspeptic disorder, nocturnal restlessness and twinges of pain in the small joints. They are apt to have irritability of temper and depression of spirits. The first symptom of the attack is great pain in the metatarso-phalangeal joint of the great toe which usually comes on suddenly at night

with swelling, heat and discoloration around the joint. The skin pits on pressure and becomes shiny. The temperature promptly rises to 102 and 103 degrees F. Towards morning the symptoms generally abate to recur again the next night. This lasts from five to eight days, the symptoms gradually abating. The urine is scanty, high colored, of high specific gravity and acid in reaction. It deposits urates on cooling and often contains a small quantity of albumin. There may also be traces of sugar. The term retrocedent or suppressed gout implies a sudden disappearance of the gout from its external site; the external symptoms disappear and symptoms of derangements of the internal organs appear. There may be severe gastro-intestinal symptoms, pain, vomiting, diarrhoea, faintness and a rapid, feeble pulse; and death may occur. The cardiac symptoms are pain, shortness of breath and irregular action of the heart. These may appear with varying severity. Intense cerebral symptoms may occur as maniacal excitement and coma, and even apoplexy may develop, but are more commonly due to uraemic poisons.

Chronic Gout.—This follows repeated attacks of the acute form. The articular symptoms continue for a longer time and the condition extends to other joints. The chalk deposits slowly increase until the joint becomes swollen and deformed. The morbid changes already described are quite characteristic. The urine is increased in quantity, of low specific gravity and may contain a slight amount of albumin with hyaline and granular casts.

Irregular Gout.—This form is seen in persons who have been gouty or have marked hereditary predisposition. It includes a set of symptoms that are not alone distinctive, but when taken with this gouty tendency all forms of irregular gout can be readily recognized. The most important manifestations are the following:

Cutaneous Eruptions.—Eczema is frequently associated with gouty diathesis.

Gastro-Intestinal Disturbances.—The symptoms presented are those of lithaemia. Intestinal colic sometimes followed by diarrhoea, pharyngitis, tonsilitis and even a gouty parotitis may be manifested.

Cardio-Vascular Symptoms.—Nutritional disorders which are associated with an excessive amount of uric acid in the blood, by increasing the blood tension, excites arterio sclerosis, chronic interstitial nephritis, and changes in the muscles of the heart. Thrombosis of the coronary arteries and aneurisms may occur and prove fatal; also a blood vessel may give way in the brain, producing apoplexy which proves fatal.

Nervous Manifestations.—Nervous manifestations such as headache, migraine, neuralgias (sciatica and paraesthesias), cramps in the legs, tingling, itching, burning sensations, pain in the hands and feet, and hot itching eyeballs may occur.

Urinary Disorders.—The urine is highly colored, of high specific gravity, highly acid and may deposit lithic acid on standing. In many cases the amount of uric acid is only increased at intervals forming the so-called uric acid showers and at times the amount may be diminished. Sugar is sometimes found in the urine and the diseased condition may pass into true diabetes mellitus. Oxaluria calculi, urethritis, prostatitis and orchitis may all depend upon gout.

Pulmonary Disturbances.—Chronic bronchitis occurs frequently; there are, however, no characteristic changes.

Ocular Disorders.—Iritis, conjunctivitis, keratitis, haemorrhagic retinitis, glaucoma, and suppurative panopthalmitis may occur.

Treatment.—The hygienic treatment of gout is very essential. The patient should live a quiet life, avoiding mental

and physical strains. Plenty of fresh air, exercise and regular hours should be insisted upon. Alcoholic drinking should be avoided and the food taken in moderate quantities. Keeping the skin active by the use of cold baths if the patient is strong, and if he is weak the warm bath should be substituted, is a helpful measure. The dress of the patient should be warm and suitable for the climate.

A regulated diet of nutritious food taken at regular hours is necessary. Each patient should receive separate instructions as to the diet. The food given may be small amounts of beef, mutton and chicken, with fresh vegetables; and fruits may be used with the exception of strawberries, tomatoes and bananas. Also, milk and stale bread with fresh butter is suitable. The patient should avoid tea, coffee, pastry, hot breads, highly seasoned dishes, and such articles. The free use of water is beneficial.

The osteopathic treatment consists of careful manipulation of the lesions of the spinal column in order to free the nerve force to the affected region. The spinal treatment in gout is the most essential treatment and is very effective. A most thorough examination should be made of the tissues about the diseased area; in the foot the astragalus oftentimes is subdislocated from its articulations and causing obstructions to the local vessels and nerves. The metatarsal bones should receive due attention, as occasionally one of the bones corresponding to the affected tissues are dislocated, usually downward. All the joints between the diseased tissues and the spinal nerve centers should be carefully manipulated so as to favor a better circulation. Dur- a severe attack of gout, besides careful treatment of the blood supply to the diseased region, wrapping the joint in cotton wool and applying warmth and moisture to the joint may be helpful.

The kidneys, liver and bowels are to be kept active. I

find that a light treatment to the kidneys and liver each time is very helpful in aiding the organs to eliminate the waste material; and especially to control any inflammation that may exist in the kidney. The essential treatment in gout is to relieve the disorder of the nerve centers, to increase the activities of the emunctories, and to regulate the hygiene of the patient.

MUSCULAR RHEUMATISM.

Synonym.—Myalgia.

Definition.—A painful disease of the voluntary muscles and of the fascia and periosteum to which they are attached. The pain is greatly increased by motion and pressure.

Etiology.—It has not been decided whether the muscular tissues are the seat of the affection or whether the disease is due to a neuralgia of the sensory nerve that is distributed throughout the muscles. Osteopathic experience with cases of muscular rheumatism show that the lesion affects the nerves as they pass to and from the spine and muscles. The lesion is caused principally by slight dislocations of the vertebrae, ribs or pelvis, according to the region involved. A gouty or rheumatic diathesis, heredity, exposure to cold and wet, and previous attacks are predisposing causes. Men are more often affected, owing to their more frequent exposure. The disease affects persons of all ages. It occurs in acute, sub-acute and chronic forms.

Morbid Anatomy.—In chronic cases there is often atrophy of the muscles, generally due to interference of the trophic nerves. The disease rarely proves fatal.

Symptoms.—These are generally local and are never accompanied by marked constitutional disturbances. There is seldom fever and the pulse is only slightly increased in frequency. Pain is the chief symptom; it is increased by motion or pressure. Tenderness is generally present and there

may be swelling of the tissues. The duration is from a few hours to several weeks. The disease is very apt to recur.

The principal varieties are:

Lumbago.—This is a painful affection of the muscles of the loins and their tendinous attachments. The onset is generally sudden. In severe cases it sometimes renders the patient utterly helpless.

Torticollis, or Stiff Neck.—The muscles of the side and back of the neck are affected. The affection is usually confined to one side of the head. Any attempt to turn the head causes a sharp pain. It most frequently affects the young and sometimes becomes chronic.

Pleurodynia.—The intercostal muscles and sometimes the pectorals and serratus magnus are affected. It usually affects but one side, most frequently the left; it is the most painful form of the disease since the pain is aggravated by the normal movements of the chest. The respiratory movements are consequently restricted on the affected side. The absence of fever and physical signs will readily distinguish it from pleurisy. In intercostal neuralgia the pain follows the distribution of the nerves and there are tender spots along their course. The preceding are the only affections that are liable to be confounded with pleurodynia.

There are other forms of muscular rheumatism—cephalodynia, affecting the muscles of the scalp; scapulodynia, omodynia and dorsodynia, affecting the muscles of the shoulder and upper part of the back; abdominal rheumatism affecting the muscles of the abdomen; and there may also be a myalgia of the muscles of the extremities.

Prognosis.—The prognosis is good. Favorable results are the general rule under careful treatment.

Treatment.—Muscular rheumatism is usually an easy affection to cure. The cause of the disturbance is generally found in the region involved, and is due, in the majority of

cases, to some dislocated tissue, commonly a bone, that irritates the nerves to the muscles. In addition to correcting the lesions, stretching of the muscles, application of heat, and rest are beneficial.

Lumbago.—In this form there is found a slight lateral deviation of some vertebrae along the lower dorsal or lumbar region. Occasionally, a floating rib becomes displaced and causes the myalgia. To the osteopathic physician it seems useless as far as a cure is concerned, to prescribe blisters, plasters, needles, morphine, etc., in a case of muscular rheumatism. The disease is commonly easily cured by removing some slight lesion caused by a dorsal or lumbar vertebra or lower rib being dislocated. Stretching of the loins by placing the patient upon his side and flexing the thighs on the abdomen is very helpful.

Torticollis, or Stiff Neck.—This variety of myalgia is generally due to a lesion in the middle cervical vertebrae. The lesion is usually between the third, fourth and fifth vertebrae. A simple reduction of the sub-dislocation will relieve the attack. Stretching of the muscles and application of heat will also be of aid.

In some cases of torticollis there is a curvature of the cervical spine; and occasionally the muscles are more or less fibrinous. In such instances a cure can not always be accomplished.

A few cases of acute torticollis are caused by some of the deep muscular fibres becoming caught around a process of a vertebra. Severe contraction of the muscles by cold or extensive rotary flexions of the neck, may result in torticollis. Occasionally a case is found due to injury at birth. The injury may be to a nerve center, a nerve or to the muscles. The spinal accessory is the nerve generally involved. Lesions to the spinal accessory may occur commonly at the third, fourth and fifth cervicals, or at the atlas

and axis. The muscles involved in torticollis are the sterno-cleido-mastoid, trapezius, splenius and scaleni. Operations should not be performed until after a thorough course of treatment.

Pleurodynia.—This is really a neuralgia of the pleural nerves. It is usually caused by dislocations of the ribs, exactly over the regions involved. Occasionally a lesion may exist to the corresponding vertebra, but rarely. The rib is usually completely dislocated. Applications of heat and rest of the part are of aid.

Cephalodynia.—The muscles of the scalp are generally involved by lesions in the upper five cervical vertebrae.

Scapulodynia, Omodynia and Dorsodynia.—The muscles of the shoulder are usually affected by displacements of the second and third ribs, although the lesion may be found slightly lower in the ribs, or in the corresponding vertebrae. The lower cervical vertebrae may also be at fault. Dislocations of the shoulder occur frequently; and muscular fibres may slip out of the bicipital groove. In a few cases muscles may become contracted about the coracoid process; or the acromial end of the clavicle may become dislocated.

Abdominal Rheumatism.—Is generally caused by lesions in the lower six dorsal vertebrae, which involves the innervation to the muscles. In some cases lesions of the lower ribs are found; and in a few instances a lesion may be discerned in the upper lumbar vertebrae.

Myalgia of the Extremities.—Upper Extremity.—The myalgia is caused by lesions of the cervical or upper dorsal vertebrae, or upper ribs. Occasionally some trouble may be found in the shoulder or elbow joints.

Lower Extremity.—Lesions may be found in the lower dorsal or lumbar vertebrae; or there may be derangements of the pelvic bones. Occasionally disorder is found at the hip or knee joints.

LITHAEMIA.

Synonyms.—Acid diathesis; uricaemia; uric acidaemia.

Definition.—A constitutional disease due to the faulty oxidation of nitrogenous matter and the formation of uric acid. It is characterized by an excess of uric acid in the blood, varied digestion and circulatory and nervous phenomena.

Etiology.—Impaired digestion, inactivity of the liver, insufficient exercise, over-eating, over-drinking and sometimes heredity are usual causes. Lesions may be located in the splanchnic region.

Lithaemia differs from gout in being comparatively speaking, a latent condition; the joint deposits and joint inflammation being absent. It is extremely common.

Symptoms.—*Gastro-Intestinal Symptoms.*—The appetite varies greatly, sometimes it is lost; at other times it is inordinate or it may be perverted. The tongue is coated, the breath is heavy and there is an unpleasant taste. The bowels are generally constipated. In some cases there is fullness, oppression and sometimes nausea and vomiting after meals. The liver is enlarged and tender.

Circulatory Symptoms.—There is high arterial tension due to the action of the uric acid upon the vaso-motor nerves. Palpitation may occur, especially after meals. There is sharp accentuation of the aortic second sound. The pulse is slow.

Nervous Symptoms.—There is vertigo, headache, depression of spirits, extreme nervous irritability, and neuralgic pains may occur anywhere in the body.

Urinary Symptoms.—The urine is scanty, high colored, of high specific gravity and on standing deposits an abundant sediment. In the sediment may be found mixed urates, uric acid, sugar, and oxalate of lime crystals. The urine is

irritating on account of the solids, causing dull aching in the loins and burning in the penis after micturition.

Diagnosis.—This depends upon the general symptoms, the condition of the urine and the habits of the patient.

Prognosis.—This is ordinarily favorable. Long and judicious treatment is necessary to effect a cure.

Treatment.—In this disease it is very evident that the food should be thoroughly masticated and over-eating and over-drinking reduced. Exercise in the open air should be taken so that the fats in the body may be consumed.

Attention to the diet is important; it is better to give principally albuminoids. Green vegetables, fish, oysters, game and fruit will be found suitable.

Thorough treatment should be given the liver and kidneys. All the secretory organs should act freely. The use of alkaline waters will be a helpful measure.

DIABETES MELLITUS.

Definition.—A nutritional disorder in which there is an abnormal amount of sugar in the blood; characterized by an excessive urinary discharge in which grape sugar is constantly present and by a progressive loss of flesh and strength, due to disturbances of the glycogenic and glyco-destructive functions of the organism.

Etiology.—Diabetes is not a very common disease. It affects man more frequently than woman and is a disease of adult life, ranging between the ages of thirty and sixty; though cases have occurred in the very young. It is more serious in the young, the very young seldom recovering. Hereditary influences are believed to be a predisposing cause. It affects the better classes principally and especially those of a neurotic temperament.

Obesity, certain chronic diseases (malaria, gout, syphilis), occupations taxing the mind, and pregnancy are predispos-

ing influences. Injury or disease of the spinal cord or brain frequently cause diabetes, especially any irritation of Bernard's diabetic center in the medulla. Injuries to the spine, chiefly in the dorso-lumbar and sacral regions and to the abdomen and diseases of the pancreas or liver are oftentimes causes. Extirpation of the pancreas is immediately followed by diabetes, and if a fragment of the pancreas is left it is not always followed by diabetes. Irritation of the centers of the vaso-motor nerves to the liver, or by direct stimulus to the liver cells, is followed by glycosuria. Interference with the pneumogastric nerve also influences diabetes.

Morbid Anatomy.—The liver is enlarged, harder and darker in color than normal. Often there is fatty degeneration of the organ. The pancreas is diseased in about one-half of the cases of diabetes; the lesions found are granular atrophy, calculi, fibroid induration (due to syphilis) cancer, occlusion of the pancreatic duct, cystic disease, atrophy from pressure, and fat necrosis; and the pancreas is also sometimes found to be small, soft and anaemic.

The kidney changes are those of catarrhal nephritis (hyperaemia and overgrowth of epithelium). In the fatty degeneration hyaline changes take place in the tubular epithelium. The heart is hypertrophied in a few cases, and rarely endocarditis occurs. Arterial sclerosis is frequently met with. In the lungs acute bronchial pneumonia or croupous pneumonia is often followed by gangrene of the lungs, and tuberculosis commonly develops. Fatty emboli of the pulmonary vessels have been met with.

With the stomach dilation is common. The blood, normally containing about .15 per cent of sugar, in diabetes it may contain as high as .4 per cent. The blood plasma is usually loaded with fat but the corpuscles show no special changes.

In the nervous system are found no constant lesions,

though tumors and sclerosis of the medulla have been found. Tumors have been found pressing on the vagus. In some cases enlargement and sclerosis of the ganglia of the sympathetic systems have been noted.

Symptoms.—The onset is gradual, thirst and frequent micturition being the first symptoms noticed. Sometimes after an injury or a sudden severe nervous shock diabetes may set in abruptly. As the disease progresses there will be marked thirst, polyuria, a voracious appetite, progressive emaciation and debility. The tongue is dry, red and glazed or coated. Saliva is scanty, the teeth decay, the gums become swollen and apthous stomatitis may develop. The appetite becomes enormous. As a rule there is constipation and the skin is dry and harsh. Temperature is often subnormal; pulse frequent with increased tension.

Urine.—In some cases the urine is not increased in quantity; usually, however, the amount varies from four or five pints to eight or ten gallons in twenty-four hours. It is pale in color, of high specific gravity and acid reaction. Sugar is present in variable quantities from one or two per cent to as high as fifteen per cent. The urine has a sweetish odor and there may or may not be a sediment. Albumin is often present, glycogen has rarely been found, urea is greatly increased and uric acid may be slightly increased. Fat is sometimes present and the phosphates may be greatly in excess.

Complications.—Nervous system.—*Diabetic coma* is the most important and gravest symptom and proves fatal in most cases. There is either a sudden or gradual loss of consciousness; this may occur after some form of exhausting exercise. There may be previous headache or a feeling of intoxication. It may be preceded by nausea, vomiting, colicky pain or some local affection; such as pharyngitis or pulmonary complications. The cause of diabetic coma is

not yet known; it is probably due to a toxic agent in the blood.

Peripheral Neuritis.—Neuralgia, paraplegia, numbness, tingling and diabetic tabes characterize the pain in the legs; absence of the knee jerks, loss of power in the extensors of the foot and a peculiar gait (steppage) are frequent symptoms.

Derangement of Special Senses.—These are such as impairment of hearing, roaring in the ears and derangement of smell and taste. Cataract may develop, causing blindness; transient ptosis, strabismus, diabetic retinitis, haemorrhages, amaurosis and atrophy of the optic nerve may occur. The sexual function is lost early in the disease.

Cutaneous.—In women the irritation of the urine may cause eczema with burning and itching of the labia and vicinity, and in men a balanitis. Furuncles, boils and carbuncles are common. Gangrene and oedema are not uncommon.

Pulmonary.—Gangrene, acute pneumonia, tuberculosis and bronchial pneumonia are quite common complications.

Duration.—In some rapid cases death has occurred in from two days to six weeks. It is, however, a disease of long duration and as a rule the older the patient is at the time of onset, the slower the course. Cases of ten, fifteen or twenty years duration have been met with.

Diagnosis.—The diagnosis is very easy, as there is no other disease with which it can be confounded. Diabetes mellitus may be distinctly intermittent for a time and sugar may be absent for some time.

Prognosis.—If a patient is put upon a diet free from carbohydrates in mild cases the sugar will disappear, while in severe cases it will still be present. Mild cases yield quite readily to treatment. In cases over forty years of age the outlook is quite favorable but in cases under forty and espe-

cially the young the prognosis is not so favorable. Stout persons bear diabetes better than lean. All cases are liable to complications which render the prognosis more serious.

Treatment.—*The Osteopathic Treatment.*—In all cases of diabetes mellitus that I have examined, principally those in the A. T. Still Infirmary, I have found a posterior condition of the lower dorsal and lumbar regions. The posterior curve has always been fairly well marked and generally is a symmetrical curve. By that I mean a spinal curve that is not irregular and the relation of the various vertebrae, one to the other, are not seriously deranged. Correction of this condition of the spinal column has invariably given satisfactory result and in the majority of cases the condition of the patient has improved remarkably; and not a few, about fifty per cent, were entirely cured. To get the best results the patient should be laid on his side on the operating table and the knees drawn up so that the thighs are flexed upon the abdomen. The operator standing in front of the patient throws his weight against the flexed thighs and reaching over upon the spinal column springs the entire weakened portion of the spine toward its normal position, stretching the spinal column to separate each vertebra from its neighbor so that the impinged nerves as they pass through the intervertebral foramina may be released.

The nerves affected by the posterior pathological curve of the spine mentioned above and by separate lesions that may exist within the pathological curvature are probably the vaso-motor nerves to the portal system and the intestines. The vaso-motor nerves to the portal system are given off, principally, from the fifth to the ninth dorsal vertebrae, although fibres may escape from the cord as low as the first lumbar vertebra. The nerves to the intestines are given off principally from about the ninth dorsal to the lower lum-

bar vertebrae. Possibly there are nerve fibres direct to the hepatic cell protoplasm.

How lesions in the dorso-lumbar region cause diabetes mellitus is an important question and is indeed a hard one to answer. An unnatural acceleration of the portal circulation may cause an increased quantity of sugar to pass to the liver, resulting in part of the sugar not being changed into glycogen and thus passing into the circulation; or a paralysis of the vaso-motor nerves to the liver causes congestion and slowness of the blood stream. Thus a disturbed circulation of the liver may cause accumulation of sugar in the liver, so that the blood ferment has time to act upon the glycogen and transform it into sugar; or there may be a sacharinity of chyle or blood in the portal vein due to an impeded conversion of sugar in the intestines into lactic acid or there may be an accelerated absorption of sugar due to an abnormal state of the intestines. Hence one or many pathological changes may occur and influence a case of diabetes or more probably the cause of the disease is a disordered dorso-lumbar region.

The center for the hepatic vaso-motor nerves, "diabetic center," is in the floor of the fourth ventricle at the level of the origin of the vagi nerves. A lesion of the "diabetic center" or an obstruction to the pneumogastric anywhere along its course may cause diabetic symptoms; hence there may be lesions of the cervical region that would affect reflexly the diabetic center, or lesions of the pneumo-gastric may occur, particularly at the atlas or axis, and cause diabetic symptoms; or at least, these may influence the course of a case of diabetes mellitus.

There are nerves from the superior and inferior cervical ganglia of the sympathetic that have considerable influence upon the liver. These nerves do not pass down the cord to the splanchnics but pass in the sympathetic to the coeliac and

hepatic plexuses and then to the liver. Stimulation of these nerves causes the hepatic vessels at the periphery of the liver lobules to become contracted. Possibly in a very few cases a stagnation of blood in other vascular regions of the body may cause the blood ferment to accumulate in the blood to such an extent that diabetic symptoms occur.

Dietetic Treatment.—This is essential, but is not so necessary as some medical authors would have us believe. A regulated diet should be insisted upon in all cases but one should not go to extremes in dieting. An elimination from the dietary of such articles as are readily convertible into glucose is best. In other words, the carbohydrates should largely be excluded in the dietary. A patient's appetite is often inordinate and it will be necessary to regulate the quantity and character of foods. The following food may be included in the dietary:

Animal Foods.—Meats of every variety except livers, also game, poultry, fish and eggs.

Vegetables.—Cabbage, cauliflower, celery, lettuce, green string beans, the green ends of asparagus, tomatoes, spinach, mushrooms, cucmbers, watercress, young onions or any other green vegetable.

Bread and Cakes.—Made of gluten flour, bran flour or almond flour. Griddle cakes, biscuits, porridges, etc., may be made of these flours.

Beverages.—Skimmed milk, buttermilk, sour wines, coffee and tea, without sugar, and carbonated water.

Relishes.—Pickles, cream cheese, and nuts of all kinds except chestnuts.

Fruits.—Oranges, lemons, cranberries, cherries, strawberries, all in moderate quantities.

Other foods may be used but each case requires a thorough study in order to determine what is best to do. On

the whole it is best to eat considerable meat and abstain from garden material and fruit.

Hygienic Treatment.—Mental excitement and worry should be avoided as much as possible. Frequent bathing and regulated exercise will be of considerable aid. The diabetic patient should have a well ventilated room and plenty of rest and sleep; flannels are to be worn next to the skin the year around.

Various symptoms and complications are liable to arise, which the competent osteopath is prepared to meet by following general rules.

DIABETES INSIPIDUS.

Synonyms.—Polyuria; polydipsia; hyperuria; urinae profluxio.

Definition.—An excessive secretion of urine which has continued for some time and is free from albumin and sugar.

Etiology and Pathology.—This disease is much more frequent in males than in females. It occurs most commonly between the ages of twenty and thirty.

The lesions usually found upon osteopathic examination are lateral derangements of the vetertebrae in the renal splanchnic region, ninth to twelfth dorsals inclusive, or a slight kyphosis in the same locality. Such lesions probably affect the central nervous system in the region of the sympathetic nerves to the kidneys, by a paralysis of the muscular coat of the renal vessels. The disease may be associated with other conditions, as injuries and diseases of the nervous system elsewhere, exposure to cold, prolonged debility, and fatigue; cerebral diseases as meningitis, paralysis of the sixth nerve, tumor of the brain, and blows on the head; injuries of the cervical region, sunstroke, cerebro-spinal fever, malaria, syphilis, pregnancy. hysteria, hereditary influences, and drinking freely of cold water. Thus there are many

diseases and conditions which may be associated with diabetes insipidus, and which act as an irritant, directly or reflexly, upon the center in the medulla oblongata (which is just above the diabetic center), or upon the sympathetic ganglia in the abdominal region.

Second in importance to lesions of the renal splanchnics are lesions of the upper cervical region. Irritations in the cervical region may act upon the center in the medulla or the lesions may affect some of the sympathetic fibres as they pass from the brain to the renal sympathetics.

Lesions of the nerve centers and of the sympathetic ganglia have been found upon post-mortem examination, but they are not constant. Nervous lesions, associated with other lesions, have been found in the region of the base of the brain.

Symptoms.—Great thirst and an enormous secretion of urine of a pale, watery and slightly acid nature are the characteristic symptoms. The skin is usually dry and harsh, the bowels are constipated, and the appetite is often voracious. The health on the whole is quite perfect, although if the affection is not arrested considerable loss of flesh and strength may result.

The nervous lesion causing polyuria may be the outcome of a debilitated condition of long standing or the symptoms may occur suddenly. Preceding the large flow of urine such symptoms as nervousness, irritability, restlessness, headache, sleeplessness, failure of memory, vivid imagination, and inability to concentrate the mind commonly occur. Other symptoms may be present in addition, as debility, diarrhoea, epigastric and lumber pains, impaired mentality and impaired sexual function.

The amount of urine varies considerably in twenty-four hours; from four to five quarts to twenty-five quarts or even more has been recorded in exceptional cases. The specific

gravity is often as low as 1003, in a few cases even to 1001; it ranges usually from 1004-1010.

Diagnosis.—The diagnosis is easy. Thirst, polyuria and the absence of albumin and sugar characterise the disease.

In *diabetes mellitus*, finding of grape-sugar in the urine would at once exclude polyuria.

In *paroxysmal diuresis*, the increased amount of urine is not permanent.

In *interstitial nephritis*, there is albumin, casts, etc.

Prognosis.—The disease yields to treatment much quicker than diabetes mellitus and is without doubt a less serious disease. The disease in a fairly large majority of cases can be cured. The duration of the disease varies considerably; cases have ended fatally in a few weeks, others have continued for many years or until some intercurrent disease has ended life. By careful osteopathic treatment most cases will yield good results or be cured in from a few weeks to six months.

Treatment.—The treatment of the disease causing diabetes insipidus is of the first consequence, but very often such a disease is undiscoverable.

Correcting lesions of the renal splanchnics is important; in fact, in a fair number of cases treatment of this locality will entirely cure the disease. I have found that a very effective treatment, in addition to the ordinary methods of treatment, is to have the patient lie flat upon the back while the physician reaches around the patient on either side, placing the fingers firmly upon the transverse processes of the lower dorsal vertebrae and spring the spine forward by lifting upward on the patient, enough even to raise the patient from the surface he is lying on. This treatment is especially effective in lessening the increased amount of urine.

Attention should be given to the false ribs on either side

and to the condition of the spine below and above the renal splanchnics. The cervical vertebrae should be examined carefully for disorders, and if any are found they should be removed at once if possible.

Hygienic treatment is of as much importance as in diabetes mellitus. The clothing should be warm, warm baths taken, and general friction and care of the skin should be indulged in so that the circulation may be somewhat diverted from the kidneys. Restriction of water is not necessary, only in cases where excessive drinking has become a habit, as the thirst is caused by the diuresis and not the diuresis by the large ingestion of water.

RICKETS.

Synonym.—Rachitis.

Definition.—A constitutional disease of infants, characterized by impaired nutrition and changes in the growing bones causing deformities.

Etiology.—Rickets may occur in the new-born but it rarely begins before the child is six months old. It is a disease of the first and second years of life. There is no evidence that rickets is hereditary, but certain races, especially the Negro and Italian, have a tendency to be rickety. The disease is much more common in the large cities than in rural districts. It is more common in Europe than in America, especially in Vienna, London and Paris. The disease is most frequently met with among the ill-fed and badly housed poor of the large cities. Improper or insufficient food, bad air, want of sunlight, a starchy diet, prolonged lactation, exposure to cold and dampness, and syphilis are predisposing factors. Male and female children are affected equally.

Morbid Anatomy.—The most marked changes are seen in the long bones and the ribs. The cartilage between the

epiphysis and shaft is thickened and is soft and irregular in outline. The line of ossification is irregular and the parts are vascular, soft and spongy; while the periosteum is thickened and easily separable from the shaft, leaving the soft porous bone exposed. Microscopic examination shows an increased rate of proliferation of the cartilage cells with scanty calcification. The bones are soft and there is a marked diminution in the calcareous salts upon chemical analysis of the bones. In the cranium the frontal and parietal eminences are very prominent while the top of the head and the occiput are flattened giving the head a square appearance. In the parietal and occipital regions ossification may be delayed producing the so-called cranial tabes in which the bones yield readily to pressure. The fontanelles remain open until the second or third year of life. The ribs become affected very early. At the point where the ribs join the costal cartilages swelling occurs forming the so-called "rachitic rosary." The normal shape of the chest walls is markedly changed. Just outside the junction of the ribs with the cartilages the ribs fall in, producing a shallow depression while the sternum and cartilages are pushed forward. There is also a transverse groove called Harrison's groove passing outward from the ensiform cartilage towards the axilla.

The liver, spleen and sometimes the mesenteric glands are enlarged.

Symptoms.—The onset is slow and in many cases digestive disturbances with their usual effect upon the nutrition precede the appearance of the characteristic lesions. The child is irritable, restless, sleeps poorly, and there is usually slight fever. There are profuse sweats especially about the head and neck. There is diffused soreness of the body and the child is prone to throw off the bed-clothes. The child

is languid, pale, puny and feeble with slight diarrhoea and delayed dentition. The tissues are soft and flabby and skeletal changes begin to make their appearance. Among the first are changes in the ribs and head already described under morbid anatomy. Changes sometimes occur in the bones of the face particularly the maxillae which are reduced in size. Dentition is delayed and when the teeth do appear they are usually small, badly formed and soon decay. The spinal column is frequently curved anterio-posteriorly or laterally. The long bones are curved and their extremities become greatly thickened. The pelvis is distorted and twisted and in women this may seriously complicate labor. Usually the child becomes more or less emaciated but "fat rickets" sometimes occurs. The abdomen is large and prominent, this is due partly to flatulent distention and partly to the enlargement of the liver and spleen.

Complications.—Tetany, convulsions, laryngismus stridulus, bronchial catarrh, broncho-pneumonia, emphysema, collapse of the lung, diarrhoea, chronic hydrocephalus, and green stick fractures may occur.

Prognosis.—Rickets are not directly fatal but death is not uncommon from intercurrent affections.

Treatment.—Rickets being a disease of mal-nutrition due to hereditary weakness of the digestive organs, improper food or to influences of disease, the treatment must be principally following hygienic rules and good dieting. The child under six months if not nursed satisfactorily by the mother should have a suitable wet nurse. When a wet nurse can not be procured, cow's milk diluted according to the age of the child is best. Diluting the milk with barley water is recommended highly. If curds are found in the stools the digestion is not perfect and is usually due to overfeeding of the child. The child should be out doors as much as possible. The fresh air is much preferable even when the

temperature is quite low than the damp dark room of the house. Even the worst air outside is better than the best air of the house as far as purity is concerned. Protect the child carefully with warm clothes and when sitting or walking the child should be properly supported. Tepid baths will be found helpful.

In the older child, beef juice, light meats, yolks of eggs, green vegetables and fruits may be given. After ossification the deformities may be corrected by the orthopedic surgeon. Careful treatment of the various affected tissues of the child will aid a great deal in correcting deformities. The manipulations of the lesions found will also aid in increasing the nutrition to the involved tissues. Possibly treatment of the "nutritional" centers, fourth dorsal and fourth lumbar (pudic nerves), would be effectual. The digestive disturbances should receive special care. Carefully guard against complications of the nervous and respiratory systems.

All those conditions which predispose to rickets should receive attention; chief among these is the care of the nutrition of the mother during pregnancy. Nursing and frequent pregnancies should be regulated.

OBESITY.

Synonyms.—Adipositas universalis; polysarcia adiposa; corpulence.

Definition.—Obesity is essentially a nutritional disease and is an inconvenient accumulation of adipose tissue in the body and sometimes impairing the bodily function.

Etiology.—Heredity, over-eating, sedentary habits, hot, moist climates, and the prolonged use of arsenic are predisposing causes. The exciting causes are especially the eating of fat-making food, excessive use of alcohol and insufficient exercise. Fat may be derived from excessive use of

albumin, fat and carbohydrates; also from beer, porter, ale and the like. An excessive diet of starches and sugars will indirectly act as fat producers. Sexual continence probably contributes to corpulence. Congenital obesity is seen in infancy and early childhood, but it is generally not manifested until after the middle period of life.

Symptoms.—It seems hardly necessary to describe the appearance of persons suffering from obesity. The round, fat face, double chin, hanging cheeks, large waist, the thick, prominent, sometimes pendulous, abdomen, and the bulky, elephantine extremities form a characteristic feature. At first obesity presents no harmful symptoms. Usually the first troublesome symptom is increased frequency in the breathing rate on exertion, due to a weak heart and to the fact that the motion of the lungs is hampered by the heavy chest walls; and also by the interference with the descent of diaphragm on account of the enlarged liver. At first there is cardiac hypertrophy, later the heart is overlaid with fat, and there is fatty infiltration of the muscular walls. The arteries also may show fatty changes. The pulse is usually frequent but may be irregular and as low as fifty beats to the minute.

Complications.—The complications may be oedema, pulmonary congestion, cardiac asthma, hernia, albuminuria, interstitial nephritis, cerebral haemorrhages or coma.

Treatment.—Obesity being a nutritional disease of the body it seems but reasonable that alterations of the anatomical structures will produce a change in the proper balance of nutrition. Along osteopathic lines possibly derangements of tissues affecting the nerves to the lymphatic system will produce obesity. In the majority of cases that I have examined I have found disturbances at the sixth and seventh cervical, fourth and fifth dorsal and from the tenth dorsal to the second lumbar. Lesions at these points could

readily interfere with the thoracic duct and the receptaculum chyli. It is claimed that stimulation of the splanchnic nerves causes dilatation of the receptaculum chyli.

The dietetic treatment is essential, the principle being to furnish less food to oxidize. The carbohydrates especially should be lessened. There are many plans of dietetic treatment for obesity, for which the reader is referred to Thompson's Practical Dietetics, or other good works on dietetics. Another important point in the treatment is exercise, which must be carried out in a systematic way. Rules can be laid down only in individual cases and should be governed by the physician in charge. The principal of mechanical treatment is to promote oxidation.

SCURVY.

Synonym.—Scorbutus.

Definition.—A constitutional disease characterized by extreme general weakness, anaemia, a peculiar spongy condition of the gums, and a tendency to haemorrhages.

Etiology.—In comparison with former times scurvy is now a rare disease. The disease has been known from the earliest times and was almost always met with among the sailors. It is still seen in camps, prisons and almhouses; it has, however, gradually disappeared from the naval surface. Lack of fresh vegetables or their substitutes, over-crowding, dampness, bad hygienic surroundings, depressing influences, nostalgia, and prolonged fatigue under depressing influences are the predisposing causes.

Morbid Anatomy.—Extravasations of blood into the skin, muscles and mucous membranes occur. Haemorrhages may occur in the internal organs, especially the kidneys, liver and in the serous membranes. The gums are swollen and sometimes ulcerated and the teeth sometimes drop out. The spleen is soft and enlarged. Ulcers some-

times occur in the skin and bowels. The blood is dark and fluid and the changes are those of anaemia without leucocytosis.

Symptoms.—The general manifestations of anaemia with great weakness are among the first symptoms. The gums are swollen, soft and spongy; they bleed easily and in severe cases there is ulceration. Subcutaneous ecchymosis occurs, first on the legs, then on the arms and trunk. Haemorrhages from the mucous membrane frequently occur. The temperature is usually normal. The pulse is small, feeble and frequent, sometimes irregular and slow. The appetite is impaired and constipation is present as a rule.

Diagnosis.—The disease is readily recognized when several cases occur together. It is somewhat hard to recognize in isolated cases, and to be able to distinguish it from certain forms of purpura. The etiology, the gingival changes and the haemorrhages usually decide the diagnosis.

Prognosis.—The prognosis is favorable unless the disease is far advanced. Sporadic cases invariably get well.

Treatment.—Scurvy being a disease due to malnutrition, it is best to relieve such condition by attention and correction of the faults producing it. Hygienic surroundings and a wholesome diet will do more in curing the disease than anything else. An out-door life and good ventilation with anti-scorbutics as meat, lemons, fresh vegetables and fresh milk is the indicated treatment. It is held by Garrod that scurvy is caused by an absence of potash, for a deficiency of potassium salts is found in the blood; and such anti-scorbutics as named above contain potash. A careful treatment along the splanchnics would help to improve the appetite and digestion.

INFANTILE SCURVY.

Synonyms.—Barlow's disease; periosteal cachexia.

This form sometimes follows the prolonged use of condensed milk, sterilized milk or proprietary foods for children. This disease occurs at any period after four months, but it is most common from the ninth to the eighteenth month.

The child is pale, has a muddy complexion and may show signs of rickets. The gums may be soft and spongy. There is great tenderness and pain on motion, causing the child to cry out. The lower limbs are kept drawn up and are motionless. The bones become thickened from sub-periosteal haemorrhage. Later the limbs may lie in a state of pseudo-paralysis. The back becomes very weak. The lesions are usually symmetrical. The temperature is very erratic; it may be normal or sub-normal, but rarely above 101 or 102 degrees F.

Treatment.—The treatment of scurvy in children consists in first omitting all proprietary foods and to substitute fresh cow's milk, beef juice, strained gruel and a moderate quantity of fresh orange or peach juice. Under this treatment cases that have not progressed too far prompt recovery will follow.

Northrop says: "It is a significant fact that the country which furnishes most of the literature of scorbutus in children is the same which is posted from end to end with advertisements of proprietary foods."

PURPURA.

Synonyms.—Morbus maculosus; hemophilia; peliosis.

Definition.—Purpura is always a symptom rather than a disease. Under the term of purpura are arranged a number of affections characterized by extravasation of blood in-

to the skin and bleeding from the mucous membranes. These extravasation do not disappear upon pressure and vary greatly in size. When minute they are called petechiae; when large they are known as ecchymosis. At first they are bright red and gradually become darker untill they fade into brownish stains.

SYMPTOMATIC PURPURA.

The purpura of infectious diseases as seen in pyaemia, septicaemia, mycotic endocarditis, typhus fever, small pox and scarlet fever.

Toxic.—The extravasations produced by venomous snake bites.

Certain Medicines.—Copaiba, ergot, mercury, quinine, belladonna, iodides and others in over doses. In certain persons, even small doses of the above mentioned medicines may be followed by purpura.

Cachectic.—Purpura may attend cancer, tuberculosis, Hodgkin's disease, Bright's disease and scurvy.

Senile Purpura.—The spots are generally confined to the extremities in the debility of old age.

Neurotic.—Certain nervous diseases, hysterical conditions in which bleeding spots or stigmata appear on the skin, locomotor ataxia, myelitis and in severe neuralgia.

Mechanical.—From venous stasis as seen in a paroxysmal cough, whooping cough and epilepsy.

ARTHRITIC PURPURA.

Synonym.—Rheumatic purpura.

This form is characterized by involvement of the joints. Three varieties are recognized:

Purpura Simplex.—This is a mild form, seen most commonly in children. The spots are found upon the legs, more rarely upon the trunk and arms. Articular pains may or

may not occur. Fever is seldom present. Loss of appetite, diarrhoea and slight anaemia may be manifested. The patients get well in a week. or ten days.

Peliosis Rheumatica (*Shönlein's Disease*).—This is a much more serious affection characterized by multiple arthritis and an eruption which may be simply purpuric; or it may be associated with urticarial wheals or with erythema exudativum. It is more common in males between the ages of fourteen and thirty. The spots usually occur first upon the legs and around the affected joints. The joints are swollen and painful and the temperature rises to 101 and 103 degrees F. The amount of oedema varies greatly and occasionally it is quite excessive. Endocarditis, haematuria and haemorrhagic nephritis are complications which may arise. Relapses may occur; recovery is the rule.

Henoch's Purpura.—This variety is seen most frequently in children and is characterized by severe gastro-intestinal disturbances as pain, vomiting and diarrhoea, haemorrhages from the mucous membranes and acute enlargement of the spleen in addition to the symptoms already named under the foregoing form. The prognosis is good.

Diagnosis.—This is easily made on account of the joint symptoms associated with the purpura and urticaria.

Prognosis.—Cases usually do well. Fatal terminations are extremely rare. Relapses may occur and the disease may return at the same time for several years in succession.

PURPURA HAEMORRHAGICA.

Synonym.—Morbus maculosus Werlhofii.

This is a condition characterized by extravasations of blood into the skin and haemorrhages from the mucous membranes. It is most commonly met with in delicate girls during early life; but it may occur at any age and in the most robust of either sex. After a couple of days of

languor and weakness, purpuric spots appear upon the skin; and bleeding occurs from the mucous membranes and may cause profound anaemia. There is usually light fever. Favorable cases recover in ten days or two weeks. Death may result from loss of blood or from haemorrhage into the brain. In the purpura fulminans cutaneous haemorrhages develop with great rapidity and death may occur before haemorrhages from the mucous membranes take place.

Diagnosis.—Scurvy is the only condition that could be mistaken for purpura haemorrhagica. The absence of the conditions which favor scurvy as well as the absence of the swelling of the gums will decide the diagnosis.

Treatment.—In the treatment of purpura the disease from which it develops should receive due attention. Occasionally there is danger of a physician overlooking the primary disease and treating some symptom of the disease, although it is true that sometimes an important symptom is nearly all that is manifested in the disease. Outside of treating the conditions under which symptomatic purpura arises, general measures should be considered as a nutritious diet, fresh air, and general treatment of the patient so that normal circulation and strength may be restored. The treatment of the purpura locally should be such as to restore normal circulation of the part by removing any obstruction or irritation of the blood supply that may be found, by careful manipulation of the tissues. As stated the management of the disease under which it arises should be embraced in the treatment. In cases of haemorrhage from various organs see article under haemorrhage. Some cutaneous hemorrhages are best relieved by local manipulation.

HAEMORRHAGIC DISEASES OF THE NEW BORN.

Haemorrhagic Syphilis.—Usually the child is born healthy and in a few days after birth extensive cutaneous extravasa-

tions, bleeding from the mucous surfaces and from the naval occur. The skin becomes jaundiced. The child dies at the end of a week or ten days. The post-mortem shows syphilitic lesions of the liver, lungs and other organs.

Epidemic Haemoglobinuria (Winckel's Disease).—This usually sets in about the fourth day after birth and is a very fatal affection. There are marked intestinal disturbances as vomiting, diarrhoea, fever, jaundice, rapid breathing and sometimes cyanosis. The urine contains albumin and methaemoglobin. The child seldom lives more than two days. The post-mortem shows the spleen enlarged and there are punctiform haemorrhages on the surface of the internal organs. There is an absence of any septic condition of the umbilical vessels. Fatty degeneration of the heart and liver —the so-called Buhl's disease—may occur.

Morbus Maculosus Neonatorum.—In this form the bleeding generally begins within the first week, but in rare instances it may be delayed until the second or third. The nature of the disease is unknown. Haemorrhage from the bowels is the most frequent form, but it may be from the stomach, mouth, nose, naval, or naval alone. There is jaundice or fever; and there is an apparent absence of any post-mortem lesions. Ulcers of the oesophagus, stomach and duodenum have been found. It usually proves fatal in from two to seven days.

Treatment.—The treatment is principally to keep the patient warm and absolute rest with the head low; and if nursing at the breast is too much exertion for the child, feeding in a recumbent position with a teaspoon should be resorted to. A most careful manipulation should be given as in other cases of haemorrhages to control the circulation.

HAEMOPHILIA.

Synonyms.—Haemorrhaphilia; haemorrhagic diathesis; "bleeders disease."

Definition.—A congenital condition manifested by tendency to uncontrollable haemorrhage with or without injury.

Etiology.—In the majority of cases the disposition is hereditary. The condition may be acquired but nothing is known of the conditions under which the disease may thus arise in healthy stock.

The usual mode of transmission is through the female line, rather than by the male. The mother does not necessarily have to be a bleeder, but the daughter of one in order to transmit the disease to her offsprings. Atavism through the female alone is almost the rule. Not all the children of a bleeding family are afflicted; the male children are more subject to the condition than the female children. The tendency usually appears within the first two years of life. The families of bleeders are usually large and are commonly healthy looking and have fine soft skins.

Morbid Anatomy.—An unusual thinness of the blood vessels with a fatty degeneration of the intima has been noted. In many cases there is deficient coagulability of the blood. Haemorrhages have been found in and about the capsules of the joints; and in a few instances inflammation of the synovial surfaces. The arteries are situated superficially but that does not explain anything. The real nature of the disease has not been determined. The frailty of the blood vessels and the peculiar constitution of the blood preventing thrombotic formation are the two facts of importance that have been recognized.

Symptoms.—Haemorrhages occur from the most trifling injuries. Blowing the nose may cause severe epistaxis; the extraction of a tooth is a frequent cause of haemorrhage;

the prick of a pin, a slight cut, a scratch, or a slight blow may result in profuse bleeding.

The bleeding may occur spontaneously from the mucous membrane of the mouth, nose, lungs, intestines, etc.; or it may occur directly from the fingers, toes, back of the hands, and lobes of the ears without any noticeable change in the skin. The bleeding may continue for days or weeks and prove fatal in spite of all means to check it. The haemorrhages often last twenty-four hours. As soon as checked the patients rapidly resume natural appearance providing the bleeding is not often repeated, thereby causing a permanent anemia. There may be attacks of arthritis with fever, as with acquired haemorrhagic tendency, closely resembling rheumatism.

Diagnosis.—Haemophilia can not be confounded with any other affection.

Prognosis.—Bleeders seldom reach an old age. In a few cases the tendency to bleed gradually diminishes until at last it entirely ceases. Death generally terminates within a few weeks from the time of development which may not be until adult life. The younger the subject the more is it liable to prove fatal. In the majority of cases death occurs between the first and eighth year. After maturity the chances of an attack is much lessened.

Treatment.—Members of a bleeder's family, particularly the boys, should be guarded against traumatic influences, and operations of all kinds should be avoided.

Out-door exercises, fresh air, bathing and plain nourishing food, in fact, the entire hygienic surroundings, and all food should be carefully watched so that the threatened subject may become strengthened and hardened. Marriage should be discouraged, especially with the daughters, as it is through them the tendency is propagated. Possibly, coupled with the foregoing prophylactic treatment, a stim-

ulation of the glands of elaboration of the blood will be of service to build up the physical constitution of the patient.

During attacks absolute rest and the required symptomatic treatment should be given. For consequent anemia the usual treatment is to be employed. It has been shown by experiment that the transmission of blood from healthy stock to the wound of a bleeder will arrest the haemorrhage by favoring the formation of a thrombus.

SECTION V.

DISEASES OF THE DIGESTIVE SYSTEM.

DISEASES OF THE MOUTH.

STOMATITIS.

Definition.—Inflammation of the mouth.

Etiology.—Chemical, mechanical, thermal or parasitic irritations; secondary to disorders of the gastro-intestinal tract; sacrlet fever, measles and variola; cachexia, due to such diseases as cancer and phthisis; dentition, artificial feeding, hot weather and poor hygienic surroundings (the most common causes); lesions to the innervation and vascular supply of the mouth are principally found in the upper cervical vertebrae.

Varieties.—*Catarrhal, apthous, ulcerative, parasitic, gangrenous.*

CATARRHAL STOMATITIS.

Synonyms.—Simple stomatitis; catarrah of the mouth; erythematous.

Etiology.—Most common in infants and children. Hot and irritating substances; secondary to diseases of the stomach, to measles, scarlet fever and variola; difficult dentition; alcoholic or tobacco excesses.

Symptoms.—Diffuse red swelling of the mucous membrane, heat and pain in the mouth, increased flow of saliva, fetor of breath, restlessness and languor. There is a disinclination to nurse and a slight fever may be present. The sense of taste is blunted and there is commonly a bitter taste in the mouth.

Treatment.—Removal of the exciting cause is the most important point in the treatment. Good hygienic conditions must be enforced. The mouth should be kept clean; mop it out at frequent intervals with a soft wad of absorbent cotton and cold or ice water. Attention should be paid to the diet and secretions. Light but thorough treatment of the upper cervical region is to be given with careful treatment

of the tissues about and below the angles of the jaw, so that the innervation and blood supply may be equalized.

APTHOUS STOMATITIS.

Synonyms.—Follicular stomatitis; vesicular stomatitis; croupous stomatitis; aptha; canker.

Etiology.—This disease is characterized by little grayish-white spots upon the superficial layer of the mucous membrane. They consist primarily of an exudate of fibrin and wandered-out leucocytes. It is principally a disease of childhood. Among the common causes are difficult dentition, disorders of digestion and uncleanliness of the mouth, such as neglect to cleanse the child's mouth after nursing. It may be a symptom of measles or of local diseases.

Possibly the innervation to the region of the little grayish-white spots or canker is obstructed at some point by a disordered tissue. The lesion may be mechanical or it may arise from a disordered digestion. If one is able to locate such a lesion a cure would be hastened. The seat of the infection is the internal surface of the cheeks, gums, roof of mouth, tongue and lips.

Symptoms.—There is redness of the mucous membrane of the mouth followed by the appearance of the vesicles with a red areola. Pain in the mouth and an increased flow of saliva occurs. The mastication, deglutition and even talking may be painful. This condition is followed by sleeplessness, feverishness, diarrhoea and fetor of the breath.

Treatment.—Removal of the cause as in other varieties of stomatitis is paramount. Give attention to the food. The milk should be sterilized. The disordered digestion should be corrected at once. All secretions must receive prompt attention. The child should be nursed at regular intervals. Locally, keep the parts clean and carefully treat the innervation.

ULCERATIVE STOMATITIS.

Synonyms.—Stomacace; fetid stomatitis; diptheritic stomatitis; putrid sore throat;

Etiology.—This is a disease of children, although it may not be limited to them, as it occasionally occurs in epidemics and affects all ages. It occurs chiefly in the families of the poor and in places where the hygienic surroundings are bad, the food poor and personal cleanliness lacking. It may begin as an apthous stomatitis. Often sufferers from severe acute diseases are subjects of attack.

Symptoms.—The gums of the lower jaw are chiefly affected. They are at first congested, swollen and bleed readily. Pain is increased by mastication and deglutition, the mouth is hot, the breath fetid, the saliva dribbles and the digestion and bowels are disordered. The ulcers may appear at various points upon the cheeks, lips and tongue.

In the more severe cases the gums are spongy and the teeth are loosened. In proportion to the constitutional disturbances fever and enlargement and tenderness of the submaxillary glands occurs. Even necrosis of the bone may follow.

Mercurial Stomatitis (*ptyalism*) is a form of stomatitis seen in artisans who work in mercury. A frequent attendant of mercurialization in all instances is found whether from handling the mercury or after its administration as a medicine. The first symptom usually observed is fetor of the breath which is followed by tenderness of the gums, a metallic taste and increase of saliva and redness of the gums near the insertion of the teeth. These premonitory symptoms are followed in severe cases by profuse salivation, protrusion of the tongue if that organ is affected, ulceration of the mucous membrane, loss of teeth and necrosis of the jaw.

Syphilitic Stomatitis is also ulcerative. The syphilitic ulcers exhibit the same gray color; but are found in the throat

as well as at various points of the mucous membrane of the mouth. They are much deeper than those of ulcerative stomatitis but do not bleed as easily nor are they as angry looking.

Diagnosis.—The disease may be confounded with gangrenous stomatitis, although the progress of the disease is slower and there are less constitutional symptoms.

Scurvy, though a general disease, is characterized by ulceration of the mouth, but the general symptoms will usually make the diagnosis easy.

Prognosis.—Is favorable if the disease is promptly and properly treated.

Treatment.—The hygienic surroundings should at once be corrected; this being remedied any tendency to an epidemic will be eliminated. In all forms of stomatitis the etiology of the affection must be removed before a cure can be hastily accomplished. Pay strict attention to the diet and secretions. The mucous membrane of the mouth must be kept absolutely clean. An antiseptic wash is necessary. Carbolic acid, a teaspoonful to four ounces of water, listerine, diluted with twice as much water, or any other antiseptic may be used. Treatment of the vascular supply and innervation of the mouth as in other forms of stomatitis is indicated. Especially should general treatment not be overlooked. Pay attention to the bowels. Vaso-motor nerves to the mouth are from the second to fifth dorsals.

PARASITIC STOMATITIS.

Synonyms.—Thrush; miguet; sprue; white mouth; mycotic stomatitis.

Etiology.—The exciting cause is a fungus known as oidium albicans or saccharomyces albicans. It is claimed that a catarrhal stomatitis is the soil upon which the fungus develops. Parasitic stomatitis is chiefly a disease of nursing children and is promoted by unhygienic conditions. It is

seldom seen after ten years of age occurring in adults only in the last stages of consumption or cancer.

Symptoms.—Upon inspection there is seen numerous milk white elevations. These appear first about the angles of the mouth soon extending to all parts of the mouth, even in a few cases to the pharynx and to the oesophagus. The general symptoms of stomatitis are present. Pain upon mastication and swallowing, fetid hot breath, increased saliva, increased temperature, restlessness, swollen lips and disordered digestion occur.

Diagnosis.—The microscope will remove all doubt as to the nature of the affection. In apthous stomatitis the ulcers are preceded by the formation of vesicles.

Prognosis.—Is favorable in the majority of cases.

Treatment.—Hygienic measures, absolute cleanliness, correction of the disorders of the gastro-intestinal tract and local treatment as in other forms of stomatitis is the required treatment.

GANGRENOUS STOMATITIS.

Synonyms.—Cancrum oris; noma; water cancer.

Etiology.—A rare disease that attacks debilitated children probably due to some parasitic micro-organism. It is usually seen between the ages of two and six years. It is usually a sequelae to specific fevers, especially measles and whooping cough.

Symptoms.—Its approach is usually insidious. Ulcerative stomatitis or a sloughing ulcer on the gums or on the inside of the cheek being first noted. Even a gangrenous odor may be the first symptom noticed. The process is essentially a rapidly progressive moist gangrene. The cheek swells and becomes oedematous until finally the whole side of the face is involved. The mild form is generally limited to perforation of the cheek. In severe cases the bones of both jaws, the eyelids and ears may be involved. High

fever, 104 degrees F., may be present. The pulse is rapid and feeble and the adjacent lymphatics are swollen. The patient rarely recovers, death occurring in from five to seven days.

Treatment.—Local treatment of the cervical region, hygienic measures, nourishing food, local antiseptics and the actual cautery.

DISEASES OF THE TONGUE.

GLOSSITIS.

Inflammation of the parenchyma of the tongue is a rare disease. It may be either acute or chronic, the result of direct injury to the tongue, boiling liquids, corrosive substances, accidental biting, poisonous stings, the sharp edges of the teeth or the use of a tobacco pipe. In a few cases the atlas may be found anterior.

Symptoms.—The tongue is greatly congested, reddened, swollen and painful. It may be so swollen that speech is difficult as well as mastication and swallowing. In fact in a few cases it may be so large that it protrudes from the mouth. Obstruction to breathing may occur, also restlessness, fever and increased flow of saliva. In a few instances suppuration takes place.

Treatment.—Ice applied constantly internally and externally at the angles of the jaw, or the persistent use of hot water held in the mouth and applied externally; with a continued thoroughly relaxed condition of the cervical muscles about the angle of the jaw and also the deep cervical muscles will generally give prompt relief. If pus has formed the use of the lancet must be employed. If suffocation is imminent perform tracheotomy. Pay due attention to the general health.

DISEASES OF THE SALIVARY GLANDS.

Hyper-secretion.—(*Ptyalism.*)—This is an abnormal increase in the secretion of saliva. It is a common effect of certain drugs as mercury, gold, copper and iodine; and vegetable substances producing the same results are jaborandi, muscarin and tobacco. Ptyalism may be the result of oral-disease—noma and ulcerative stomatitis. It is sometimes seen in small pox, during gestation, in rabies, and occasionally in mental and nervous affections.

Xerostoma (*Aptyalism "Dry Mouth."*)—This is a condition in which the salivary and buccal secretions are arrested. The tongue is red, dry, glazed and sometimes cracked. The mucous membrane is dry, smooth and shiny. Mastication, deglutition and articulation are difficult. This is a rare condition and the majority of cases have been observed in women in conjunction with nervous phenomena. It is probably due to an interference with the center which controls the salivary and buccal secretions.

Treatment.—The treatment of hypersecretion and xerostoma depends altogether upon the conditions producing them; although treatment over and around the salivary glands in dry mouth will tend to stimulate the glands' activity. The center or the nerves from the center that control the secretion of saliva and buccal glands may be interfered with by a dislocated atlas usually an anterior dislocation. Secretory fibers to the submaxillary gland are from the second and third dorsals.

Symptomatic Parotitis (*Parotid Bubo.*)—Inflammation of the parotid glands apart from mumps, occurs under the following conditions:

(1) In the course of infectious fever—typhoid, typhus, scarlet fever, pneumonia and pyaemia. It may also occur in secondary syphilis. Parotitis is seen especially in typhoid

fever. It is doubtless either the result of septic infection or due to the extention of inflammation through the duct of Steno. The inflammation is often intense, going on rapidly to suppuration.

(2) In connection with diseases or injury of the abdomen or pelvis especially of the genito-urinary tract. Also, injury or disease of the alimentary canal, of the abdominal walls, peritoneum or the pelvic cellular tissue may produce it. Derangements of the testes or ovaries, the use of a pessary, menstruation or pregnancy may also cause it.

(3) Peripheral neuritis with facial paralysis (Gower's).

Treatment.—When the parotid glands are involved the deep tissues about the angles of the jaw are usually severely contracted or the atlas and axis are displaced. A reduction of such derangements is usually very effectual in obtaining relief from the involved glands. In a few instances the deep lateral cervical muscles and even the first and second ribs on the sides affected are found deranged. There is probably in such instances an involvement of all the cervical lymphatics on the side affected.

Applications of cold, especially ice, should be used at first. If the affection has progressed to a later stage use hot applications and the lancet, if suppuration has occurred, should be employed.

Chronic Parotitis.—The glands are enlarged and may be tender and painful or painless. It may succeed mumps or acute inflammation of the throat. It is also met with in Bright's disease, syphilis and in mercury or lead poisoning.

Treatment.—In cases of chronic parotitis the atlas and axis are commonly subdislocated anteriorly; or else there is a rotary lesion of the atlas, the gland involved being generally on the side of the transverse process the farther anterior.

DISEASES OF THE TONSILS.

ACUTE TONSILLITIS.

Synonyms.—Quinsy; acute parenchymatous tonsillitis; phlegmonous pharyngitis; amygdalitis; tonsillar abscess; cynanche tonsillaris.

Definition.—An acute parenchymatous inflammation of the tonsil.

Etiology.—Exposure to cold and wet are probably the most common causes. Injuries and strains to the upper cervical vertebrae are occasionally found. In a few cases infection may be the cause. Many persons have a predisposition to attacks of tonsillitis and probably all that a predisposition means in a large percentage of cases is that there is a weakened or strained condition of the upper cervical vertebrae; and whenever one is exposed to atmospherical changes the uneven contraction of the cervical muscles deranges still more the already disordered tissues and the lesions to the vaso-motor and secretory nerves of the tonsils are increased. The disease usually occurs between the tenth and fortieth years.

Morbid Anatomy.—One or both of the tonsils, more often one, swells rapidly and may extend to the median line, in fact, if both tonsils are affected the isthmus of the fauces may become occluded. The tonsils as well as the adjacent musoca becomes red and sensitive. The surface of the tonsils present yellowish patches. Where distended follicles of the gland are protruding, the tonsils are painful and if undergoing suppuration it gradually softens.

Symptoms.—The onset is commonly somewhat sudden, with rigors and a temperature of 104 to 105 degrees F., while the pulse is full, bounding and frequent, 110 to 130 per minute. The jaws are stiff and painful on account of the swelling at the angle. There is difficulty in swallowing

and in opening the mouth, the voice is greatly changed, the salivation increased and respiration may be considerably impeded. Accompanying this condition is headache, thirst, an anxious face, earache, deafness and pain in the floor of the mouth and Eustachian tubes.

When suppuration is imminent the pain becomes increased and throbbing, the patient more depressed, the fever higher and all the symptoms are increased. The rupture of the abscess may occur spontaneously or from an effort of vomiting. The contents of the abscess is ejected from the mouth or if the contents should go into the larynx suffocation would probably occur. The disease lasts from three to seven days. It may terminate by suppuration or by gradual resolution.

Prognosis.—In the large majority of cases the prognosis is favorable. The danger lies in suffocation, the rupture of the abscess or where the obstruction is complete by double sided quinsy and where the giving of food is seriously interferred with.

Treatment.—At the beginning of the attack measures should be taken to subdue the inflammation as much as possible. Treatment should be given often, to free the lingual, tonsillar, pharyngeal and palatine vessels. Strong treatment should be applied over the tonsillar, nasal and external pharyngeal plexuses. A thorough examination should be given to determine any lesions at the cervical sympathetic to vaso-motor fibres of the fifth cranial and glosso-pharyngeal nerves. Pay particular attention to the condition of the upper cervical vertebrae and also to relaxing the cervical muscles especially the antero-lateral muscles over the region of the tonsils. A downward, forward, firm treatment from the angle of the inferior maxillary over the tonsils to the anterior median line of the body is a very effectual treatment in such cases.

The bowels and other excretory organs should be kept active from the beginning of the attack and the diet should be of the nature of fluids, as thin oat meal, gruel, peptonoids, milk, beaten eggs, meat juice, etc., so that they can be most easily swallowed. Cold or hot applications about the neck and pellets of ice held in the mouth will be helpful. Examine the tonsils frequently with the finger and when suppuration occurs use the lance. If there is danger from suffocation the tonsil may be taken entirely out and in extreme cases tracheotomy may be performed.

CHRONIC ENLARGEMENT OF THE TONSILS.

Synonyms.—Chronic naso-pharyngeal obstruction; chronic tonsillitis and adenoids; mouth breathing; aprosexia.

Definition.—A chronic inflammatory enlargement of the tonsils. A chronic inflammatory enlargement of the adenoid tissues of the pharynx will also be considered here.

Etiology.—Repeated attacks of acute tonsillitis is a common cause. Chronic lesions of the upper cervical vertebrae involving the innervation and blood supply to and from the naso-pharyngeal region. Diseases associated with circulatory disturbances of the region of the tonsil, as scarlet fever, diphtheria and measles. Rheumatism, rachitis, tuberculosis and syphilis are occasional causes. The disease may be hereditary. Skin diseases, improper food and unsuitable surroundings may favor the disease.

Adenoids are frequently associated with chronic enlarged tonsils. The disease may be congenital. Age is an important etiological factor, the disease occurring usually between the ages of three and fifteen years.

The two diseases are so intimately associated that one rarely sees enlarged tonsils without adenoids and those conditions that would cause chronic enlarged tonsils would cause adenoids of the naso-pharyngeal region. The ade-

noids occur most frequently in boys at the ages stated above.

Morbid Anatomy.—All the tissues of the tonsils are increased in size, especially the number of lymphoid cells. In fact, the enlargement is a true lymphoid overgrowth. The enlargement is usually symmetrical and firm, in children the tonsil is in a developmental stage and is not as firm as in the adult. The crypts are deepened and widened making the surface of the tonsil quite uneven. The opening into the throat varies according to the size of the enlarged tissues and may be almost closed.

The adenoids are hyperplasia of the lymphoid tissues in the naso-pharynx. In children the mass is soft and lobulated after the manner of the enlarged tonsils.

Symptoms.—In a few simple cases there may be no symptoms until the tonsils or lymphatics further enlarge, caused by an acute attack. The first symptom noticeable is an obstructed breathing necessitating the patient to breathe through his mouth largely. This especially disturbs his rest and is the cause of considerable dyspnoea. The blood is poorly oxygenated as a result and the general health may be greatly impaired. The voice is thick and muffled, the breath fetid and there may be difficulty in deglutition. The hearing is usually defective and smell and taste are impaired. A constant cough is a very annoying symptom. Epistaxis is frequent. This condition gives rise to the so-called "chicken breast" and is quite common when the lymphatics of the upper air passages are enlarged. These children usually complain of headache, a dried parched mouth and tiredness, and are as a rule dull and stupid. Their countenance is expressionless. They have a broad nose, thick everted lips and the mouth is open. They do not learn easily nor readily at school and the teacher should have patience with them as their hearing is generally impaired and their night's

rest disturbed. On the whole both mental and physical deterioration gradually occurs.

Diagnosis.—There should be very little difficulty in the diagnosis. Enlarged tonsils and adenoid growth can be determined quite readily through the external wall but a thorough digital examination will be more accurate.

Malignant growths of the tonsils are of rare occurrence, especially in children. They start on one side, are very painful, bright red in color and grow rapidly.

Prognosis.—Depends largely upon early discovery of the disease, although persistent treatment in severe cases will usually cause the disease to yield to some extent at least. It requires several months' treatment in a large percentage of the cases to accomplish much. Removal of the growth in a few cases will be best. After the disease has been cured the peculiar facial expression and deformity of the chest will be outgrown. In a majority of cases the adenoids and tonsils will atrophy at puberty, but something should be done before that late day as both the mentality and physicality may be greatly impaired.

Treatment.—Requires most careful and painstaking work. In many cases the work will seem discouraging on account of the slowness of the case to yield to treatment. An attempt should be made during each treatment to correct any disordered cervical vertebrae that may be found. Thorough and continuous treatment should be applied over the tonsils and glands externally. A downward, forward and sweeping motion over the tonsils and glands is best. Pay attention to the condition of the clavicle and upper ribs so that they may not interfere with the vascular system in the naso-pharynx. Occasionally an internal treatment through the mouth to the soft palate will be helpful.

Care should be taken of the spine especially in the dorsal region and of the ribs. If the chest is deformed an at-

tempt should be made to correct the disordered condition. A nutritious diet and due attention to hygienic surroundings is certainly advisable.

Those cases that have been subject to snoring and still the habit remains can overcome that annoyance by the wearing of a cloth or pad over the mouth during the night. When the voice remains altered after the case has been cured training of the voice should be encouraged to overcome the defect. A few cases will require removal of the growth but this should not be done until after a thorough course of treatment and then as a last resort.

DISEASES OF THE PHARYNX.

ACUTE CATARRHAL PHARYNGITIS.

Synonyms.—Sore throat; simple angina.

Definition.—An acute catarrhal inflammation of the mucous membrane of the pharynx, tonsils, soft palate and uvula.

Etiology.—Exposure to atmospherical changes are the most frequent causes. A strained condition of the upper cervical or lower dorsal vertebrae predisposes to an attack. Improper use of the voice may produce the disease, also, hot drinks and local irritants. Thoracic diseases, weakness and debility, rheumatism, gout, scrofula and infectious fevers are occasional causes.

Symptoms.—Chilliness, slight fever, dryness and soreness of the throat are the first symptoms. Associated with these symptoms is painful deglutition, a hacking cough, dryness, soreness and tickling of the throat, and tenderness and stiffness of the neck muscles. The inflammation may extend into the Eustachian tubes, causing more or less deafness or into the larynx causing hoarseness. Upon inspection of the throat, the mucous membrane is red and swollen. The cali-

bre of the pharynx is lessened and the uvula enlarged. Whitish spots may occur on the mucous membrane and in a few cases ulcers will be present.

Prognosis.—The prognosis is favorable in a large majority of cases. Most cases are readily cured, rarely lasting longer than a week.

Treatment.—Many cases get well without any treatment. In severe cases if the patient would remain in bed twenty-four hours and attend carefully to himself the inflammation would rapidly subside. The aim of the treatment is first to correct any slight strain or irregularity that may exist in the cervical vertebrae, chiefly the atlas, and impinge upon the innervation to the pharynx, viz., pneumogastric, spinal accessory, glosso-pharyngeal and sympathetic nerves. These nerves form the pharyngeal plexus which sends fibres to the mucous membrane of the pharynx and soft palate as well as to the muscles in the same region. Following this correction a thorough relaxation should be given to all the cervical muscles, superficial and deep, especially over the pharynx and the deep cervical muscles. By a firm, downward and inward movement from the loba of the ear around the angle of the inferior maxillary considerable relief may be given by this mechanical freeing of the pharyngeal blood vessels.

Should the inflammation extend upward into the Eustachian tube, a finger introduced through the mouth to the roof of the soft palate, and thoroughly relaxing the tissues and inhibiting the local nerves will be of considerable benefit not only in relieving the inflammation of the Eustcahian tube but also in lessening the pharyngeal swelling and in clearing the nasal passages.

In a number of cases of acute pharyngeal inflammation slight lesions to the lower dorsal vertebrae and severely contracted muscles of the same region will be found. This evi-

dently causes the soreness of the pharynx, for upon correction of these parts immediate relief will be given the sufferer. I have seen well marked cases of acute catarrhal pharyngitis with a temperature 102 degrees F. cured in two or three hours by treatment of the lower splanchnics. The pharyngitis in such cases might be due to an interference in the circuit between the two great reflex brains, cervical sympathetic and solar plexus, which are connected by the spinal cord and splanchnic nerves on the one side and the vagi on the other. A few cases of pharyngeal inflammation are associated with chronic irritations of the pelvic organs. Thus care should be taken that obstinate cases do not present some pelvic disorder. A light nutritious diet and attention to the excretory organs should be given in all cases.

CHRONIC PHARYNGITIS.

Etiology.—This disease is found oftener in the adult than in the child. Repeated attacks of acute pharyngitis is a common cause of the disease. Chronic lesions to the upper cervical vertebrae oftentimes occur. Improper use of the voice as by public speakers and singers. Continuous action of irritants, like tobacco smoke, the irritating discharges trickling down the fauces from a chronic nasal catarrh, irritating gases and dust, and alcoholic drinking.

Varieties.—*Hypertrophic.*—The mucous membrane is thickened and inflamed. The lymphatic tissues of the pharynx become granular in appearance and the veins greatly dilated. This is the so-called granular or chronic follicular pharyngitis or clergyman's sore throat.

Atrophic.—In this form the mucous membrane becomes pale, dry and atrophied with a smooth glossy appearance.

Ulcerated.—The common form of chronic pharyngitis, seldom produces ulceration. A lowered nutrition as found in various infectious diseases, syphilis, tuberculosis, diphtheria and cancer are the primary causes.

Phlegmonous.—A suppurating inflammation involving the pharynx except post-pharyngeal abscess. It is due to infectious fevers, quincy, injuries, corrosive poisons and foreign bodies.

Post-pharyngeal Abscess.—A phlegmonous inflammation behind the pharyngeal tissues proper, caused by caries of the cervical vertebrae and inflammation of the local lympatics and favored by a depraved nutrition.

Symptoms.—There is a constant desire to clear the throat. A fullness, tickling and various sensations in the throat are present. The secretions of the throat are increased and the voice is husky.

When ulceration occurs pain is present during swallowing. Especially so is the pain intense in phlegmonous pharyngitis, and post-pharyngeal abscess as well. Also swelling and stiffness of the neck, fever and exhaustion are prominent symptoms.

Treatment.—To remove the cause of the disease is of first importance whether it is due to nasal catarrh, smoking, luxated cervical vertebrae, the use of alcohol or foreign bodies. Other treatment will be of little use until the irritation producing the disease is removed and the general health carefully looked after.

The nasal pharyngeal region should be kept clear, care being taken with the use of the voice and scraping of the throat stopped. The patient should live an out-door life. Sponging of the throat night and morning, first, with warm water, then, with cold water will lessen the liability of the patient to acute attacks from exposure. With thorough cooperation on the part of the patient in carefully taking care of himself the osteopathic physician can in most instances cure the case, or at least give great relief by a persistent course of treatment. The treatment must be directed to the innervation and blood supply of the pharynx. Correcting

the disordered cervical vertebrae or upper ribs or a clavicle, and by thoroughly relaxing the cervical muscles, chiefly the deep vertebral muscles, and by firm direct treatment over the pharynx, as in acute catarrhal pharyngitis, will be the necessary treatment.

In phelgmonous pharyngitis everything should be done locally that would be helpful in lessening the inflammation. Thorough treatment and close attention to the affected parts is necessary. Locally ice will be of aid. Pus when formed should be freed at once. The case can not be watched too closely for gangrene may occur. It is best to have the aid of a surgeon. Post-pharyngeal abscesses requires incision and evacuation at once, besides treatment directed to its cause.

DISEASES OF THE OESOPHAGUS.

ACUTE OESOPHAGITIS.

Etiology.—Traumatism is the most common etiological factor, the inflammation being such as is induced by the presence of foreign bodies; chemical irritations from corrosive poisons and thermal irritations from the swallowing of hot liquids occasionally cause oesophagitis. Other causes are the catarrhal processes of the specific fevers, extension from catarrh of the pharynx and local diseases of the oesophagus.

Morbid Anatomy.—The morbid changes are those of simple catarrhal inflammation of the mucosa. Commonly the epithelium is thickened and undergoes rapid desquamation so that the surface is covered with a fine granular substance. Follicular ulcers may occur from the swelling and breaking of the mucous glands. The diphtheretic false membrane when occurring in the oesophagus presents the same characters as elsewhere, and is seldom found in the lower portion.

The calibre of the oesophagus may be diminished by a purulent inflammation of the sub-mucosa, the pus generally passing into the oesophagus.

Symptoms.—Pain beneath the sternum, increased by deglutition is always present. In mild forms of a catarrhal nature the pain beneath the sternum is duller and may be absent. But in some severe cases the symptoms may all be mild so that a true condition of the disease can not be determined in every case from the symptoms. Mucus and blood and occasionally pus may be discharged from the oesophagus. In severe cases spasms of the oesophagus may occur.

Treatment.—A bland diet should be given, preferably milk, and when the dysphagia is intense it will be best to feed entirely by enemata.

The treatment of oesophagitis is principally executed through the innervation of that organ, the pneumogastric and sympathetic. Branches from the pneumogastric are given off above and below the pulmonary branches. A correction of any of the cervical vertebrae that might involve the pneumogastric, and thorough treatment of the spinal column from the sixth cervical to the eleventh dorsal, besides a raising and spreading of the ribs chiefly at their sternal ends is necessary. Fragments of ice may be given and cold applications externally often give relief.

SPASMS OF THE OESOPHAGUS.

Etiology.—Spasmodic contraction of the muscular layer of the oesophagus is due to several causes. The irritation that produces the spasm is generally of reflex origin and is found in those of a nervous temperament, especially hysterical and hypochondriacal patients. Occasionally the innervation of the oesophagus is irritated at some point; generally a rib or a middle dorsal vertebra act as the irritant. It

occurs as a symptom in organic oesophageal obstruction, hydrophobia, tetanus, chorea and epilepsy.

Symptoms.—Dysphagia is the chief symptom. Pain beneath the sternum, choking feeling and inability to swallow food usually accompany the dysphagia. An oesophageal bougie can generally be passed without much difficulty.

Diagnosis.—Careful attention to the symptoms, the use of the sound, the age and sex and the absence of any wasting symptoms or others that might indicate organic stricture, will usually readily determine the condition.

Prognosis.—Is always favorable, although it is impossible to prognose the duration of the condition.

Treatment.—A thorough search should be made to find an irritation or cause on which the condition depends. If found to be due to reflex irritation or to lesions of a rib or vertebra the disorder should be corrected. Attention to the diet, hygienic surroundings and an occasional passage of the bougie, the psychic effect of which is particularly good, are usually followed by a speedy and permanent cure.

ORGANIC OESOPHAGEAL OBSTRUCTION.

Etiology.—There are several conditions that may result in organic obstruction of the oesophagus: (a) Congenital narrowing. (b) A tumor external to the oesophagus causing pressure such as aneurisms, enlarged thyroid, enlarged lymphatics and various other tumors. (c) A tumor growing in the walls, generally a cancer. (d) Cicatricial constriction from ulceration usually due to syphilis or corrosive poison. (e) Foreign bodies.

Symptoms.—Difficulty in swallowing, regurgitation of food, and considerable emaciation are symptomatic. A permanent obstruction is found upon the passage of a bougie.

Diagnosis.—Obstruction from a cicatrix may occur anywhere in the oesophagus but is usually found high up or

low down. Corrosive poison or history of syphilis would suggest a cicatricial obstruction.

In cancer the cachetic condition, the age, pain, enlargement of cervical lymph glands and enlargement of other organs indicate the nature of the obstruction. Examination should be carefully made for an aneurism before passing the bougie, as an aneurism may produce all the symptoms of organic oesophageal obstructions.

Treatment.—The treatment in most instances requires surgical work; although lesions may be found to the innervation and vascular supply of the oesophagus which warrant persistent and continued treatment. In most cases if the patient is willing oesophagotomy or gastrotomy should be performed to prolong life. Rectal feeding may be necessary. In aneurism little can be done to strengthen the walls of the affected portion of the vessel. Perhaps careful treatment to the innervation of the muscular coat of the vessels, rest and dieting will be of aid. Surgical works should be consulted. The prognosis is unfavorable, especially in cancerous conditions. In cicatricial contraction a systematic dilation with graduated bougies should be performed with thorough treatment of the innervation of the oesophagus. The prognosis in such cases is usually quite favorable. An enlarged thyroid can usually be reduced by the treatment indicated for such disorder.

For other disorders of the oesophagus consult surgical works.

DISEASES OF THE STOMACH.

ACUTE CATARRHAL GASTRITIS.

Synonyms.—Acute gastric catarrh; acute dyspepsia; gastric fever.

Definition.—An acute catarrhal inflammation of the stomach due to simple non-specific irritation.

Etiology.—This condition occurs at all ages and is usually traceable to errors of diet. Due either to the irritation of indigestible food upon the mucous membrane of the stomach or to the decay and fermentation of undigested food. Simply overloading the stomach may produce more or less inflammation. The use of too hot or too cold food or drink may induce attacks. Alcoholic excess is oftentimes the cause. Taking cold or getting wet, also mental excitement, worry and grief frequently induce the disease. Occasionally the use of tobacco brings on an attack. Injuries and irritations to the splanchnics and the vagi nerves will produce gastric fever.

Morbid Anatomy.—The mucous membrane is covered more or less with mucus. Upon removal of this mucus the membrane is found reddened and swollen. Slight hemorrhages and small erosions may occur and in some cases slight oedema of the submucous coat. Less gastric juice is secreted on account of the inflammation.

Symptoms.—In the outset there may be weakness and chilliness, with paleness and cold extremities. Later on the chilliness may alternate with flushes of heat, red face and febrile reaction. There is loss of appetite, nausea, fullness and soreness over the pit of the stomach. There is rarely any pain. To these symptoms may be added a belching of gas, headache, dizziness and mental depression; the stools become foetid and mushy, and the urine dark in color. Other symptoms may be present as epigastric distention, a coated tongue, dryness of lips, vomiting and jaundice.

Diagnosis.—Usually there is no difficulty. When the disease is preceded with a chill it is sometimes difficult to diagnose between it and infectious fevers, but a few days will furnish differential symptoms. Generally the disease is preceded by dietetic faults or some other cause can be found sufficient to produce the inflammation.

Prognosis.—Favorable in every case of simple gastritis; duration about one week.

Treatment.—Give the stomach as much rest as possible. Mild cases generally recover in a day or two if food is not allowed for twenty-four or thirty-six hours. In cases where food remains in the stomach and decomposes emesis should be produced at once.

Strict attention should be paid to the bowels so that all indigestible and putrefied matter may be eliminated besides preventing inflammation from extending downward from the stomach.

Treatment of the spinal nerves from the fourth to the tenth dorsal vertebra is essential to the cure of the disease. An irritation of these spinal nerves may produce the catarrhal inflammation of the mucous membrane. As indicated above, obstruction or irritation of the vagi nerves, especially the right vagus occasionally is an etiological factor; consequently attention must be paid to these nerves, particularly at the atlas and axis.

Vomiting is a common and distressing symptom. Pathologically, it consists in an anti-peristaltic contraction of the stomach and a spasmodic contraction of the diaphragm and the abdominal muscles. It is caused usually by irritation to the vagus nerve in the stomach or in the pharynx by irritation along the spine (particularly in the cervical and upper dorsal regions) or to the sympathetic nerves or to various parts of the body, or by direct influence of the brain. Relief can usually be given by inhibition of the pneumogastric in the occipital region or by inhibition at the fourth or fifth dorsal vertebra on the right side.

In cases of *flatulency* I have several times caused physiological absorption of the gas by direct pressure on the pit of the stomach. The pressure must be somewhat firmly and strongly exerted, it seems to remove obstructions and irri-

tations to the solar plexus. Sometimes I have been able also to absorb the gas by correcting lesions to the lower ribs especially on the left side. The gas may be manipulated downward into the intestines or by firm pressure over the stomach belching will occur. Occasionally the gas may be passed into the intestines by careful inhibitory treatment in the region of the eighth and ninth dorsal. The inhibitory treatment causes relaxation of the pyloric orifice also, inhibition of the left vagus relaxes the pylorus. Inhibition at the sixth and seventh dorsals relaxes the cardiac orifice, thus favoring the passing of gas from the stomach out through the oesophagus.

CHRONIC CATARRHAL GASTRITIS.

Synonyms.—Chronic gastric catarrh; chronic catarrhal dyspepsia.

Definition.—A chronic catarrhal inflammation of the stomach associated with excessive secretion of mucus and deranged formation of gastric juice with hpyertrophy of the coats of the stomach and atrophy of the gastric glands.

Etiology.—Repeated attacks of acute catarrhal gastritis; constant overeating; excessive use of alcohol is a common cause.

Also excessive use of coffee, tea and tobacco; improper food and imperfect mastication. Chronic injuries and lesions to the vagi and splanchnic nerves are important factors.

The disease may be secondarily produced by heart, lung, liver, pleural and kidney diseases causing a passive congestion of the stomach and ultimately the characteristic lesions of chronic catarrhal gastritis.

Morbid Anatomy.—On account of constant hyperaemic swelling of the mucosa it becomes slate colored, hypertrophied and covered by a yellowish white alkaline tenacious

mucus. The peptic glands undergo granular changes, and finally atrophy of their cells.

In more chronic cases parenchymatous and interstitial inflammation may occur leading to more or less atrophy of the glandular and mucous tissues.

Symptoms.—The symptoms vary with the extent of the mucous membrane and glands involved. The mucous membrane may be considerably covered with mucus, the secretion of the gastric juice is impaired and altogether digestion is quite imperfect. There is considerable fermentation and decomposition of the food, and peristalsis is delayed on account of absence of its natural stimulus. Loss of appetite, fullness of the stomach, epigastric tenderness and prominence, nausea and vomiting are common symptoms. The patient is irritable, peevish and gloomy, and the skin is hard, dry and pale. The tongue is coated, there is heart burn, constipation and highly-colored urine; the circulation may be feeble and there is more or less emaciation. Reflected symptoms may be present, as palpitation of the heart and a slow irregular pulse.

Diagnosis.—There is usually very little difficulty in diagnosing chronic gastric catarrh. A correct diagnosis is important as this disease may accompany carcinoma and ulcer of the stomach. *Dilation of the stomach*, diseases of the *kidneys*, *liver* and *heart* may give some trouble in making a diagnosis.

Prognosis.—This depends largely upon the cause. If it is secondary to other diseases, the prognosis depends upon the curability of the primary disease. In many instances one can not expect complete recovery, but with careful living the patient may live many years.

Treatment.—In cases depending upon other diseases the treatment of the first disorder is most essential and very little

can be done with the stomach catarrh before the other disease is remedied.

Of first importance to perform a cure is the removal of the errors in diet or other causes that may exist. Then comes rest not only of the stomach but of the body and mind and the use of good wholesome food, such as milk, eggs, oysters and green vegetables. The treatment must be persistent and thorough. In most of the cases see the patient every day. Cases of chronic disorders of the stomach usually present to the osteopathic physician marked lesions in the dorsal region from the fourth to the sixth dorsal vertebrae. Occasionally lesions will be found lower down in the dorsal splanchnics. A number of cases present lesions in the upper cervical region undoubtedly affecting the vagi nerves. A few cases present lesions in the lower cervical vertebrae possibly affecting the vagi nerves, but I am inclined to believe a few fibres of the greater splanchnics may occasionally originate as high as the lower cervical.

Treatment over the stomach is of very little use in inflammatory diseases of that organ; in fact, the treatment may be actually detrimental. The affection is usually a nervous one if there is pain upon slight pressure over the stomach that decreases upon gradual deeper pressure; and in such instance it is perfectly safe to manipulate the stomach directly. But if the pain increases with the pressure the affection is probably an inflammatory one.

A lesion at the sixth and seventh dorsal vertebrae may cause pain in the pit of the stomach by irritating the posterior spinal nerves; in these cases the cause of the pain is only superficial, not within the abdomen.

Lavage is a very helpful measure in severe cases of chronic gastric catarrh, as it washes away the mucus which is a hindrance to the secretion of the gastric juice and nau-

seous to the patient. It should be performed in the morning before eating.

Careful attention to the habits and mode of living is essential in all cases. Pay strict attention to the bowels and kidneys. A lesion occasionally exists at the cartilages of the eighth and ninth ribs in catarrh of the stomach. A correction of such a lesion may be quite necessary in order to cure certain cases.

GASTRALGIA.

Synonyms.—Cardialgia; gastrodynia; neurosis of the stomach; stomachic colic; spasm of the stomach; neuralgia of the stomach.

Definition.—A painful affection of the stomach involving the sensory nerves, paroxysmal in character, caused by various sources of irritation, and not associated with any discoverable organic lesion, with feeble heart action and symptoms of collapse.

Etiology.—Occurs mostly in women, especially those who are weak, anaemic and constipated and those who are given to worrying. It is also found in women subject to menstrual derangement and more frequently in brunettes than in blondes; it is occasionally found in healthy and stalwart men. This disease may set in as early as puberty, but is especially frequent and severe about the menopause. General nervous depression, gastric ulcer and cancer, malaria, anaemia, dietetic errors, rheumatic or gouty diathesis, excessive secretions of hydrochloric acid are all causes of gastralgia. Of most importance to the osteopath are the lesions of the ribs and vertebrae found in the splanchnic region involving the sensory nerves to the stomach. Sensory nerves to the stomach are from the sixth to the ninth dorsal inclusive, the sixth and seventh supplying the cardiac end, the eighth and ninth the pyloric end. The eighth and ninth ribs anteriorly are oftentimes involved.

Symptoms.—These most characteristic: sudden seizure by paroxysms of severe pain in the epigastrium, radiating to the back and around the lower ribs. It is of an intermittent paroxysmal character. From this it is supposed to be due to malaria, dependent upon vertebrae and rib lesions at points affected. The pain is usually relieved by pressure and by taking food or warm stimulating drinks. Rarely, nausea and vomiting and nervous symptoms (globus hystericus and unnatural hunger) are found. The attack is independent of the taking of food, and varies in duration from a few minutes to an hour or more. Sometimes the pain subsides gradually and the patient is much exhausted or the attack may cease suddenly without other symptoms. There may be vomiting, eructation of gas or watery fluid, or a discharge of a large quantity of pale or reddish urine.

Diagnosis.—This affection is to be differentiated from intercostal neuralgia, ulcer, cancer, gastric crises of locomotor ataxia, biliary and intestinal colic. In *intercostal neuralgia* the pain is not so severe but of longer duration and follows the course of an intercostal nerve. In *gastric ulcer* the pain is more continuous, there are constant dyspeptic symptoms made worse by eating, and often tenderness and vomiting of blood. In *cancer*, the age, history, constancy of pain which is increased by eating (in some cases the pain is relieved by taking food), the cachexia, haematemesis, tumor and the visible effects on the general health, distinguish it from gastralgia. Examination will generally discover a different seat of pain in *gallstone colic* and there is almost always jaundice. In *locomotor ataxia* absence of the patella reflex, loss of co-ordination, and paroxysmal pain in other parts of the body will distinguish the gastric crises of tabes from the simple gastralgia. In *intestinal colic* the pain is usually localized about the umbilicus and radiates in various directions; besides deep pressure over the umbilicus relieves the pain.

Prognosis.—Never proves fatal. Perfect recovery is oftentimes accomplished.

Treatment.—Relief can usually be given the sufferer by thorough inhibition of the splanchnics on each side of the spinous processes of the vertebrae anywhere from the fourth dorsal to the tenth dorsal, generally from the sixth to the ninth. If impairment of the vertebrae or ribs can be found the treatment indicated is to correct such displacements. Inhibition of the vagi is occasionally of some aid to relieve the pain and to relieve the stomach of any irritating material by relaxing the pylorus and thus allowing the passage of such matter into the duodenum. In relieving pain in the stomach by inhibiting the vagi more relief can usually be given by way of the left vagus than by the right. Stimulation of the vagi increases the peristaltic action of the stomach while stimulation of splanchnics lessens the peristalsis.

Pressure upon the epigastrium comonly gives relief but in a few cases pressure is unbearable. Proper care should be given the bowels as intestinal dyspepsia may produce gastralgia. In these cases of intestinal dyspepsia that disturb the stomach constipation is usually present and a thorough irrigation of the colon at bed time will be beneficial. Absolute rest and attention to the diet in severe cases is necessary.

GASTRIC ULCER.

Synonyms.—Simple ulcer; perforating ulcer;ulcer ventriculi pepticum; chronic gastric ulcer; peptic ulcer.

Definition.—An ulcer apparently arising without an exciting cause, it undoubtedly follows impaired nutrition of a limited area of the mucous membrane of the stomach, which is destroyed by the action of the gastric juice; the latter being highly acid. These ulcers are usually single and are found in the stomach and in the duodenum as far as the papillae biliariae.

Etiology.—Most common in the female sex between the ages of fifteen and forty, but it occasionally occurs in children and in adults up to sixty years of age. It is frequent among servant girls and men who follow the trade of shoemaking, tailoring, weaving or any pursuit in which the costal cartilages are pressed against the stomach. It may be due to mechanical injury in cases where there is feeble nutrition and the over-acid gastric juice digests a limited spot of the mucous membrane thus forming an ulcer. Over-distention of the stomach interfering with its nutrition and thus allowing the gastric juice to act. It may be caused by anaemia, disorders of menstruation, burns of the integument, heart disease and Bright's disease; syphilis and tuberculosis are also predisposing causes. Thrombosis and embolism are also the causes of a number of cases. Thrombosis caused from obstinate vomiting form in the nutrient gastric arteries and the circulation being thus impeded favors the solvent action of the gastric juice. These ulcers often occur in connection with diseases of the heart and blood vessels, giving rise to emboli which form in the gastric arteries that have lost their tone. *Duodenal ulcers* are not as common as the gastric and affect males most frequently. They are associated with the same causes that produce the gastric.

As in various stomach disorders lesions of the middle and lower dorsal vertebrae are found. Oftentimes lesions in the ribs are found corresponding to the middle and lower dorsal regions. The ribs may be affected at both the anterior and posterior ends. Especially the anterior ends of the eighth and ninth ribs are likely to be involved. If they are at fault the immediate locality is quite sensitive to pressure. The posterior ends of the ribs in the region of the fifth to eighth are quite apt to be found luxated. Other causes present upon examination a slight kyphosis of the dorsal vertebrae. This would probably produce a nervo-muscular atony of the

walls of the stomach, consequently weakening the various coats of the stomach. The dorsal splanchnics are usually involved in cases of gastric ulceration. Occasionally the vagi nerves are affected by the upper cervical vertebrae.

Morbid Anatomy.—The ulcer is round or oval, usually situated in the posterior wall of the pyloric portion near the lesser curvature. It gives the stomach a punched out appearance, having sloping clear cut sides, conical shape and a blunt apex. They are usually single, but a series of ulcers is not uncommon. The floor of the ulcer is usually smooth and may be formed of any of the coats of the stomach, usually the muscular. It may also be formed by an adjacent organ to which the stomach has become attached. The ulcer is usually small but may reach an enormous size. In the majority of cases where the ulcers are deep and perforate the coats of the stomach adhesions take place between the stomach and adjacent organs, especially with the pancreas and left lobe of the liver. When the ulcer is situated on the anterior wall of the stomach it may perforate and excite fatal peritonitis for adhesions do not so readily take place as when the ulcer is situated in the posterior wall.

There may be erosions of the blood vessels causing fatal hemmorrhage. Small aneurisms are sometimes found in the floor of the ulcer. The ulcers may burrow into the adjacent organs, invading the pericardium, spleen, pancreas, left lobe of the liver, gall bladder, lungs, left ventricle, omentum or pleura. The vessels invaded are the gastric artery of the lesser curvature, the splenic artery from the posterior wall, the hepatic artery and rarely the portal vein. In case of a duodenal ulcer the pancreatic or duodenal artery may become invaded. There may be fistulous communication with the colon or duodenum, and even a gastro-cutaneous fistula may form in the umbilical region.

Symptoms.—The general symptoms of ordinary dyspepsia occur. The most prominent and constant symptom is pain with tenderness. This varies greatly in character, from a mere burning or gnawing which is relieved upon taking food, to the characteristic or typical pain of ulcer, which comes on in paroxysms of the most intense gastralgia shortly after eating. The pain is not alone in the epigastrium but radiates to the back and sides. The pain is usually increased by pressure, but slight pressure often brings relief. Tenderness on pressure is a very common symptom and this requires the patient to wear the waist-band very loose. It is necessary to exercise care when examining for painful points for too great pressure may produce perforation. The tender point is usually an inch or two below the ensiform cartilage. Old ulcers of long duration with thickened bases may be recognized by the touch, feeling like tumors that are due to inflammatory thickening of the tissues.

Haemorrhage occurs to a greater or less degree in nearly all cases of ulcer. A vomiting of pure red blood which is unaltered and profuse is characteristic of ulcer. In cases of profuse haemorrhage blood quite black is found in the stools. Syncope may follow, and rarely death. Intense anaemia which is quite independent of haemorrhages, may result in the frequent recurrence of these haemorrhages. Ulcers may remain entirely latent or there may be symptoms of dyspepsia of various grades, and loss of weight from the prolonged dyspepsia. Perforation occurs in about six and one-half per cent. of all cases, though this is not necessarily fatal. Cases of recovery have been recorded. The acute perforating form occurs most frequently in women.

Diagnosis.—Haemorrhage with the gastralgia attack are the most characteristic symptoms. These with the other symptoms already named make the diagnosis of ulcer conclusive. It is quite impossible to diagnose between gastric

and *duodenal ulcers*, as the symptoms resemble one another so closely. Gastric ulcer is sometimes confounded with gastralgia, gastric cancer, chronic gastritis, occasionally with gall-stone colic, rarely with intercostal neuralgia and the gastric crises of locomotor ataxia. In *gastralgia* the general health of the patient is less frequently impaired, there is less dysmenorrhoea and chlorosis, and the pain is genally relieved upon taking food. Pressure always relieves the pain and there are longer intervals between the attacks,while in ulcer there is pain upon pressure between the attacks. *Gastric cancer* occurs after forty and the history, extreme emaciation and cachexia, palpable tumor, absence of hydrochloric acid, presence of lactic acid and coffee ground vomit differentiate it from ulcer.

In chronic gastritis there is absence of vomiting of blood, tenderness diffused more in the back, no constant pain, gastric acidity less than normal, and symptoms of indigestion are persistent and well marked.

In gallstone colic the presence of jaundice, sudden onset, sudden termination, congestion and tenderness of liver make the diagnosis quite clear.

In intercostal neuralgia there may be pain in the epigastrium, slight symptoms of dyspepsia. On examination the pain will be found to follow the course of an intercostal nerve and tender points will be found along its course.

In gastric crises of locomotor ataxia the patient has the appearance of fairly good health, the acidity of the gastric juice is wanting and the distinctive symptoms of this disease is present.

Prognosis.—Guardedly favorable; some cases are cured, others terminate in fatal haemorrhage or perforation followed by peritonitis.

Treatment.—In gastric ulcer, rest in bed is important. Great care must be taken with the diet of the patient. The

secretory and motor functions of the stomach should be rested as much as possible. Milk is probably as good a food as any, let the patient have an ounce or two every two hours. If the stomach needs complete rest rectal alimentation is to be used. In that case care must be taken not to tax the power of the lower bowel too greatly; four ounces of milk every five hours will be quite sufficient. When the patient is convalscent beef juice and gruels may be substituted.

The pain can be lessened by thorough inhibition of the splanchnics and the vagi. Hot applications over the stomach will be helpful. Vomiting may be an annoying symptom, in which case thorough work at the fourth and fifth dorsal, best on the right side, or inhibitory treatment of the vagi will usually relive it. Lavage of the stomach is good in some instances

Everything should be done to build up a healthy stomach. If the stomach disorder is secondary it will be necessary to relieve the primary disorder first. When otherwise, trouble will be found with the innervation of the stomach; and as in other stomach diseases lesions are commonly found from the fourth to the sixth dorsal vertebrae or slightly lower or else in the atlas or axis. involving fibres to the pneumogastric.

Haemorrhage of the stomach or haematemesis may be a troublesome symptom and is a condition in some cases hard to overcome. Rest in bed is absolutely necessary. Our work in haemorrhage of the stomach is entirely through the splanchnic and vagi nerves, to relieve the pressure in the affected blood vessels. Swallowing pieces of ice, cold over the stomach, treatments of the cervical region, heat to the legs and a bandage around an arm or leg will be of aid.

In all cases of gastric ulceration careful attention should

be given to vaso-motor control of the stomach by the splanchnics, to the condition of the anterior ends of the eighth and ninth ribs with their cartilages, and to the careful removal of any lesions that may exist to the vagi nerves.

GASTRIC CANCER.

Synonyms.—Cancer of the stomach; carcinoma ventriculi.

Etiology.—Little is definitely known in regard to the cause of cancer. The germ theory is undoubtedly gaining ground. In our osteopathic experience cancers seem to be due to an irritating lesion to the various tissues, as the displacement of some tissue interfering with a nerve by irritating the whole or part of its fibres, or to obstruction of a vascular channel as a vein or lymphatic duct. Possibly vaso-motor or trophic nerves may be impaired by lesions and thus involve the tissues supplied by these nerves, no matter how remote from the lesion. These, I believe, are the predisposing causes of cancers, in lowering the vitality of involved tissues. Probably a micro-organism is not only an important exciting factor but it may determine the character of the cancer. Gastric cancers are usually found in the male sex in adult life. Ulceration of the stomach and possibly heredity are predisposing causes.

Morbid Anatomy.—After the uterus, the stomach is the organ most likely to be affected by cancer. Cancer of the stomach is usually primary. Eighty per cent occur at the pylorus. Epithelioma and soft cancer are the most common varieties.

Dilatation of the stomach occurs especially if the cancer is at the pylorus and causing obstruction. The stomach is usually reduced in size, and thickening and hardening of the tissues take place. The lymphatic glands adjacent to the stomach are infiltrated. Perforation into an adjacent

organ may occur, as into the transverse colon or small intestine or even into the peritoneum causing peritonitis.

Complications.—Fatty heart; thrombosis; tuberculosis.

Symptoms—Gastric cancer develops insidiously and progressively with all the general symptoms of dyspepsia; besides continued pain and tenderness. Vomiting occurs immediately after eating if the cancer is at the cardiac orifice, and a few hours after eating if at the pyloric. The vomit often contains dark "coffee ground" material due to haemorrhage, the blood being altered by gastric juice. Free hydro-chloric acid is absent from the gastric juice, and there is anaemia, emaciation, oedema of the ankles, presence of a tumor in the epigastrium not moving with inspiration, and involvement of the superficial lymph glands, especially the supra-clavicular and inguinal glands. Jaundice may occur if the liver is large. The urine is often scanty and may contain albumin. The duration is from one to two years.

Diagnosis.—The differential diagnosis of gastric cancer from *ulcer*, *gastralgia* and *chronic gastritis* is made under gastric ulcer.

Prognosis.—While the prognosis is unfavorable, life may be prolonged by the use of proper food, cleansing of the stomach and attention to the general health of the patient.

Treatment.—Try to locate the cause by a thorough examination of the vertebrae and ribs. All should be carefully examined to locate lesions that might occur in the splanchnic and vagi nerves and thus affect the blood and lymphatic supply to the stomach.

Great care should be taken in the preparation of food. Artificially digested foods should be used so that the labor of the stomach may be diminished, and if necessary the patient should be fed rectally so that the stomach may be rested entirely. The stomach should be washed out with tepid water once a day or every other day. The best of

care of the general health must be taken, and all stimulants prohibited. The operation of gastrostomy should be considered, as it may prolong life.

DILATATION OF THE STOMACH.

Synonym.—Gastrectasis.

Definition.—A dilated stomach is a stretched stomach, having increased capacity due to nervo-muscular atony or to pyloric obstruction. Every stomach which is not retracted when empty is a dilated stomach. A dilated stomach may occur either as an acute or as a chronic condition but it is to be distinguished from temporary distention and a normally large stomach.

Etiology.—The nervo-muscular atony causing dilatation may be due to obstructive lesions in the stomach splanchnics, or to a general debility of the spine in the dorsal region (usually a kyphosis) or to continued over-eating and improper food causing a stasis and fermentation. It may also be due to over-drinking and various diseases, as phthisis, heart, liver and lung diseases, anaemia, chlorosis, acute fevers and kidney diseases causing more or less of a general nervo-muscular atony. Dilatation may result from a mechanical obstruction or narrowing of the pylorus or the duodenum by cicatricial contraction of an ulcer; from hypertrophic thickening (simple or cancerous) and congenital and pressure strictures from without by a tumor or a floating kidney. In the latter case the kidney may fall upon the horizontal portion of the duodenum and thus obstruct mechanically the passage of food from the stomach, which consequently dilates. Tight lacing might prevent the liver when congested from passing in front of the kidney and thus luxating the kidney. Dilatation of the stomach occurs at all ages although most frequently in middle aged persons.

Morbid Anatomy.—The muscular coat is thinner and more pale than normal, with more or less atrophy of the glandular tissues and an increase in capacity of the stomach. When obstruction exists at the pylorus hypertrophy of the muscular coat may occur.

Symptoms.—The symptoms are those of the disease causing the dilatation plus those of persistent chronic gastric catarrh. The patient complains of a sense of fullness in the epigastric region and there is flatulency, eructations and vomiting. The cavity of the stomach being much enlarged, great quantities are vomited each day or two which are usually considerably decomposed. There is lessened acidity of the vomited mass. Passage of the food from the stomach to the intestine is delayed and the bowels are constipated, the fecal matter being dry and hard. The urine may be scanty and the skin dry. Anaemia, debility and emaciation are always present to a greater or less extent and on account of the absorption of poisonous matter drowsiness may occur. In fatal cases death may be preceded by unconsciousness.

Physical Signs.—*Inspection.*—In some cases the outline of the distended stomach can be plainly seen. There is prominence of the epigastric region, the tumefaction being at the pyloric end of the stomach. *Palpation.*—The resistance upon manipulation of a dilated stomach is like that of an air cushion. If the patient is made to drink a half tumbler of water, bimanual palpation will cause a splashing sound to be heard along the circumference of the stomach at its lowest point; and by moving the water about and changing the position of the patient the outline of the stomach can be made out. If the sound is not heard at the first manipulation it must not be concluded that the stomach is normal for the stomach may be so dilated and flabby that it falls behind the abdominal wall like an apron. *Percussion.*—The

note is tympanitic over the greater part of the stomach until the lower curvature is reached when the sound is dull due to liquid contents of the stomach, followed by a tympanitic sound again when the intestines are reached. When percussion is made the patient should always be in a standing position if possible.

When there is pyloric obstruction a tumor usually presents itself, and vomiting is more severe and peristalsis more active than when the dilatation is due to atony of the walls of the stomach from an obstructed innervation.

Diagnosis.—This is usually easy if due care is taken in making the examination. Cases have been confounded with ovarian cyst.

Prognosis.—In a case of nervo-muscular atony the prognosis is favorable. If due to a malignant disease, a tumor or hypertrophy of the pylorus or the duodenum recovery is usually impossible. In a few cases surgical interference may be of help.

Treatment.—When the dilatation is due to atony of the muscular walls of the stomach from obstructed innervation at the spinal column, treatment is usually successful. Attenton should be given to the condition of the spinal column in the splanchnic region (fourth dorsal to twelfth dorsal), the spine being usually posterior. A thorough and persistent course of treatment must be given not only to restore the normal activity of the nerves to the muscular coat and glands of the stomach but to build up and restore strength in the weakened spinal column. Lesions in the spinal column even higher than the fourth dorsal may affect the innervation to the stomach. I know of cases where lesions are apt to occur at the fifth, sixth and seventh cervicals and interfere considerably with the action of the stomach causing nausea, flatulency, eructations, and even

vomiting. Such an affection may be through fibres of the splanchnic nerves or through fibres of the vagi nerves.

The vagi nerves have an important bearing upon gastric dilatation as paralysis of the gastric branches of the vagi arrest the peristalsis of the stomach and thus tend to favor retention of food within its cavity. The stomach in such cases becomes enlarged mainly by the weight of the food and the presence of gases due to decomposition of the retained food. Thus lesions may be found higher than the lower cervicals and cause obstruction and paralysis of the fibres of the vagi to the stomach.

Cutaneous stimulation over the stomach in the form of thorough manipulation of the stomach walls causes contraction of the muscular fibres of the stomach, mainly the circular fibres. This treatment with additional treatment of the splanchnic and the vagi nerves will tend to build up the weakened automatic Auerbach's and Meissner's plexuses of the stomach.

When the disease is due to cancer and various growths of the pylorus or the duodenum we can do nothing but palliate. Such cases may require surgical attention. In all cases it is necessary that care and preoccupation of the patient should be removed. Baths, changes of air, a carefully regulated diet and caution in the use of liquids will be of great aid to the general health of the patient and thus the weakened nervous system will be indirectly but greatly benefitted. Too great care can not be taken of the patient as there is created in the organism a special aptitude for the tissues to become inflamed and thus weaknesses at various parts of the body may occur. Phthisis, typhoid fever and various diseases are apt to follow dilatation of the stomach as the nutritive process of the body is impaired at its very beginning.

The meals should be taken regularly and with great care,

the patient not eating too quickly nor too much. Solids should be used but little, the artificially digested foods, such as peptonized milk and beef peptonoids, probably being the best. Beef juice and scraped beef are proper food as they are easily digested. Fatty and starchy foods should be avoided.

Washing out of the stomach is useful, but it should not be indiscriminately employed. Lavage will not be necessary in all cases of mechanical obstruction. The stomach should be emptied and thoroughly washed at least once a day, possibly twice a day. This relieves the distention by removing the weight and the fermenting and decomposing material.

GASTROPTOSIS AND ENTEROPTOSIS.

Synonym.—Glenard's disease.

Definition.—A downward displacement of the stomach and intestines.

Pathology.—Prolapses of the stomach and intestines are of frequent occurrence in both sexes and very common in women. It is a disease, I believe, that oftentimes passes by unrecognized and when recognized, little has been done in the way of a cure. In my estimation it is the cause of much disturbance, not only to the stomach and intestines, but to the various abdominal viscera and to the pelvic organs, especially the uterus. I believe it is the cause of quite a large percentage of prolapses of the uterus, excluding lacerations from childbirth. For not only is the great suspensory ligament of the uterus (the peritoneum) prolapsed as a consequence, but all of the abdominal viscera and the parietes of the abdomen are prolapsed and crowded down upon the pelvis. Either the small or large intestine or the stomach may be prolapsed singly. This is frequently found in the transverse portion of the colon which may be

elongated and tortuous and prolapsed nearly to the symphysis pubis. Prolapsus of the liver, spleen and kidneys may occur singly or with a general displacement of all the organs.

Etiology.—A weakened debilitated spine is the common cause. A slight posterior curvature is a frequent occurrence. A debilitated spine thus impairs the innervation to the abnominal viscera and to the muscles of the abdomen. Other causes are muscular strain, repeated pregnancies, tight lacing and mal-nutrition. A downward displacement of the floating ribs and a consequent prolapsus of the diaphragm is an important cause.

Symptoms.—The abdominal walls are weak, oftentimes flabby. The viscera of the abdomen do not have normal resistence upon manipulation. The spinal column presents lesions. There is dyspepsia, flatulency, constipation, abdominal pains and various neurasthenic symptoms.

Diagnosis.—Is readily made by the lack of tone to the abdominal walls and viscera and the general debility of the patient. Inflation of the stomach with air will determine between gastroptosis and dilatation.

Treatment.—To remove the cause is of primary importance. This is to be followed by treatment of the spinal column, correcting its various derangements and improving the innervation to the atonized viscera and abdominal parietes. Direct treatment over the abdomen helps to give tone to both the viscera and abdominal muscles. In many cases the treatment will have to be a prolonged one in order that the tissues may regain their normal condition. Usually a treatment from two months to a year or possibly more is required. The diet of the patient should consist of nutritious articles. In a few cases a supporting bandage will give some relief.

DISEASES OF THE INTESTINES.

ACUTE DIARRHOEA.

Synonyms.—Catarrhal enteritis; intestinal catarrh; acute ileo-colitis.

Definition.—A diffuse inflammation involving the entire intestinal tract to a greater or less degree; usually the seat of disease is found in the small intestine and the upper part of the large bowel.

Etiology.—Acute diarrhoea may be caused by over-eating and drinking impure water, unripe fruits, and toxic poisons produced in decomposed and fermented milk and other articles of food. This sometimes takes place in perfectly harmless substances in an inexplicable manner. Milk and ice cream often produce intense intestinal catarrh. Changes in the weather tending to weaken the system often causes diarrhoea; hot weather favors this, although a chilling of the system by a sudden fall in the temperature also produces acute diarrhoea. Changes in the quantity and quality of the secretions also induce the disorder; thus the bile, if in too great a quantity, increases the peristalsis to such a degree that diarrhoea is produced; if diminished it favors the fermentation and decomposition of the food. This is a very common cause. Infectious diseases through their specific poisons, as cholera, dysentery and typhoid fever; inflammation extending into the bowels from adjacent parts; the inflammation caused by peritonitis and intestinal obstructions, as invagination and hernia; hyperaemia secondary to diseases of the liver, heart and lungs; cachectic states met with in Addison's disease; the last stages of Bright's disease, cancer and profound anaemia are all among the causes of diarrhoea.

As in constipation diarrhoea is oftentimes simply a symptom of various disorders, still it may be the only symptom

manifested. Lesions are found in various regions of the body, but chiefly in the lower dorsal and lumbar vertebrae and the lower ribs on either side. Also lesions may be found to the vagi, thus increasing the peristalsis or affecting the blood supply of the intestines. The lesions to the splanchnics may involve the motor, vaso-motor or secretory fibres to the intestines. Oftentimes the innervation to the liver is disturbed, affecting the secretion of the bile. The left side of the spinal column is involved more often than the right side by vertebral, rib and muscular lesions.

Nervous Diarrhoea.—This frequently follows fright and other causes of nervous excitement, and is often found in hysterical women. There is simply an increase in the peristalsis and secretion of the bowel due to a vaso-motor paresis of the intestinal vessels producing an outflow of the serum.

Morbid Anatomy.—The condition is one of hyperaemia. In decided cases the mucous membrane may be red and injected, but more often it is pale and covered with a layer of mucus. Sometimes the solitary follicles of the large and small bowels become unnaturally distinct. These enlargements may become filled with pus, forming abscesses which rupture, leaving an ulcer. Peyer's patches may be prominent also.

Symptoms.—The diarrhoea is the important and often the only symptom of enteritis; the stools are frequent, varying from two or three to fifteen or more a day, thin and watery and varying in color according to the amount of bile which they contain. They are usually of a yellowish or greenish color. They contain portions of undigested food, flakes of mucus, columnar epithelium and mucous cells, micro-organisms, oxalate of lime and cholesterin. The reaction of the discharge is either acid or neutral. There are colicky pains in the abdomen, rumbling noises or borborygmi, in-

tense thirst, dry and coated tongue, with loss of appetite, and rarely a fever. Chronic catarrhal diarrhoea may follow the acute form. If the stools contain much undigested food the inflammation is in the upper bowel; if thin, watery and containing mucus, the lower bowel is involved. The general health is greatly disturbed, and the patient suffers from anaemia, emaciation, weakness and depression of spirits.

Diagnosis.—This is ordinarily made easy by giving attention to the above symptoms. In distinguishing as to whether the large or small intestines are involved the following is important: In catarrh of the small intestines, diarrhoea is not so well marked; there is much undigested food but very little mucus; and there is usually pain of a colicky nature in the middle or inferior part of the abdomen. When the large intestine is involved there may be no pain; when present it is intense and usually in the upper and lateral parts of the abdomen, there are borborygmi and thin, soupy stools, mixed with much mucus. If the lower portion of the bowel is involved there may be marked tenesmus.

Duodenitis is usually associated with acute gastritis, and, if the inflammation extends into the bile duct, with jaundice, in these cases the urine may also be bile-stained.

Prognosis.—Favorable if early and prompt treatment is employed.

Treatment.—Many cases of acute diarrhoea will recover by restricting the diet, with rest. Where improper food and water are the causes, an entire change of diet should be considered. Withdrawal of all food and substituting boiled milk will be of great aid. The bowels should never be locked up if there is reason to suspect that all irritating matters have not been removed; and where fermentation and irritation exist in the lower bowel an enema will often

be helpful. The spinal column should be examined, especially on the left side from about the fifth dorsal down to the coccyx. The vertebrae may become displaced and cause diarrhoea by derangement of the vaso-motor nerves.

Either an increased blood supply through the intestines, or the motor nerves affected, may produce the increased peristalsis. An active condition of Meissner's plexuses may be caused sympathetically, resulting in increased secretion of intestinal juice and thus in diarrhoea. The ribs may become displaced and be a source of irritation to the nerves of the intestines. The muscles of the spine are apt to become contracted by colds, injuries, strains, etc., and stimulate or inhibit the action of certain centers in the cord and produce disordered intestines. Conversely, the muscles of the back may be thrown into a contracted condition by irritating substances in the bowels acting as a stimulus to the centers in the cord and thus reflexly to the muscles. Trouble may arise in the colon and rectum by the slipping of an innominate bone, a dislocated coccyx or contracted muscles over the sacrum. In a word, thorough inhibition, relaxing contracted muscles and correcting abnormal vertebrae and ribs are the essentials of treatment for diarrhoea.

Direct treatment over the mesenteric circulation, i. e., through the abdomen anteriorly, will be helpful in some cases. It relaxes tissues, removes irritations and frees the circulation generally about the mesenteric vessels and intestines. The liver should be kept active; for although the bile is a natural purgative it is also an antiseptic to the intestinal contents and thus prevents decomposition and possibly a diarrhoea. Treatment of the vagi nerves is important, as they help to control the blood supply and the motor nerve force through the intestines. Daily hot baths and activity of the skin and kidneys are beneficial.

CHRONIC DIARRHOEA.

Synonyms.—Chronic catarrhal enteritis; chronic entero-colitis; ulcerative colitis; mucous colitis.

Definition.—A chronic inflammation of the mucous membrane of more or less of the large intestines. There may be ulceration.

Etiology.—Chronic diarrhoea may be the result of repeated attacks of the acute form or may be caused by cancer, tuberculosis, Bright's disease, typhus fever, disease of the liver, organic disease of the heart and lungs, obstructions to portal circulation or impactions of any cause that occasion passive congestion. Quite often cases of long standing are due to slight chronic lesions of the lower ribs or lower dorsal or lumbar vertebrae. The lesions of the lower ribs consist usually of downward displacement of the ribs, affecting the innervation to the intestines directly or possibly dragging the diaphragm downward to such an extent as to interfere with the blood vessels and lymph vessels as they pass through it, thus causing congestion of the intestines by the mere obstruction to the lumen of the vessels.

Morbid Anatomy.—In many cases the morbid changes are simply those of the acute form. In more pronounced cases the mucous membrane becomes of a brownish red, livid gray or slate color, this discoloration being due to hyperaemia and blood extravasation. The mucous coat is also swollen and thickened. Atrophy of the mucous membrane and in some cases of all the coats with destruction of the glands, may be a result of the chronic form. Ulceration changes occur chiefly in the lower part of the ileum and colon; these may be follicular or there may be large ulcers and considerable areas of ulceration.

Symptoms.—Constipation and diarrhoea frequently alternate, the stools are thin, mixed with a large amount of

slimy mucus. The small intestine is most frequently involved and the patient complains of pain in the umbilical region. There is distention of the bowels with gas, the health gradually declines, there is great palor, and the patient becomes emaciated, gloomy and irritable.

Mucous Colitis, or *Membranous Enteritis*.—A chronic form of colitis characterized by paroxysms of severe pain and the discharge of large masses of mucus forming gray translucent casts, which are not fibrinous, but mucoid in character. This disease occurs usually in women of nervous type, but is occasionally seen in children. Mental emotions and worry, sometimes errors in diet, or dyspepsia bring on the attack. The nutrition is generally well maintained, but in other cases there may be a gradual emaciation and ultimate death.

Diagnosis.—Diagnosis is always easy. The presence of blood, pus, or fragments of tissue in the stool point to ulceration. Ulcers in the rectum and as high as the sigmoid flexure will be recognize by examination with the speculum.

Prognosis.—This is grave in all forms of chronic diarrhoea. The deep-seated ulcerations may cause circumscribed peritonitis or even abscess and the prognosis becomes graver as these complications arise.

Treatment.—As diarrhoea may be caused from lesions anywhere from the sixth dorsal to the coccyx, a most thorough examination is necessary. On the one hand diarrhoea may be due to a marked lateral or posterior spinal curvature, which is plainly seen upon inspection, but on the other hand it may be due to a slight twist or deviation from normal of a vertebra which would require considerable osteopathic ability to exactly locate. Diarrhoea may result from a sub-luxation in the lower costal region, one or more of the three lower ribs on either side being involved. I remember one case in particular of chronic

diarrhoea, that was due to a rib dislocation. It was the case of a man fifty years of age who had suffered from chronic diarrhoea, several stools a day, for over thirty years. He was completely cured in one treatment by correcting the dislocation of the vertebral end of the tenth rib on the left side. Treatment on the left side is usually more effective in diarrhoea than treatment on the right side.

Chronic lesions of the vagi nerves may exist and produce chronic diarrhoea in the same manner as in acute diarrhoea. Rest and a liquid diet, preferably boiled milk and albumin water, will be a helpful treatment; the diet requires to have a minimum amount of waste, so that the residue will cause the least possible irritation. Beef peptonoids with the milk will be a nutritious addition to the diet, and change of air and surroundings may be an aid to a more speedy cure. The skin and kidneys should be kept in a healthy condition and, if necessary, the bowels thoroughly cleaned with injections.

DIARRHOEAS OF CHILDREN.

Three forms of diarrhoea are recognized in children: Acute dyspeptic diarrhoea, cholera infantum, acute entero-colitis.

ACUTE DYSPEPTIC DIARRHOEA.

This disease is most frequently due to errors in diet; the mother's milk may be altered in quantity or quality from taking improper food, the child may be over-nursed, or the foods given in place of the mother's milk are at fault. The predisposing causes are dentition and extreme heat; and these combined with constitutional weakness, bad hygiene and a weak spine diminish the resisting power of the infant. Hence in artificially fed children of the poorer classes this disease is very prevalent.

Morbid Anatomy.—A catarrhal swelling of the mucosa of both the small and large intestines, with enlargement of the lymph follicles. In fact, the same changes take place as those described in the enteritis of adults.

Symptoms.—The child may seem to be in its usual health with slight restlessness at night and an increased number of stools. This restlessness may be due to nausea and colicky pain. The stools are copious and offensive, containing undigested food and curds. In children over two years old these attacks may follow the eating of unripe food or drinking tainted milk. In other cases the disease may set in abruptly with vomiting, purging, griping pains and fever which rises rapidly to 104 or 105 degrees, sometimes followed by convulsions. The stools become more numerous—there may be twenty in the twenty-four hours—gray or green in color, and sometimes containing mucus, rarely blood.

Diagnosis.—The sudden onset and the character of stools, which never have a watery serous character, distinguish this from cholera infantum, and the small amount of mucus which the stool contain distinguishes them from those of ileo-colitis. This form often precedes the onset of specific fevers.

Prognosis.—Among the better classes this is generally favorable, but among the weak, half-starved children of the poor it is very unfavorable, especially in hot weather.

Treatment.—The child should be clad warmly, kept absolutely clean and given a change of diet and air if possible, with frequent baths. Sterilized milk should be given at regular intervals; or if the diarrhoea continues, beef juice and egg albumin instead. The bowels should be thoroughly cleansed by injections. The spine should be thoroughly treated through the lower dorsal and lumbar

regions, and if the abdomen is not sensitive a light treatment to the bowels directly will aid recovery.

CHOLERA INFANTUM.

Definition.—An acute catarrhal inflammation of the mucous membrane of the stomach and intestines, with some disturbance of the sympathetic ganglia. This is a disease of childhood during the first dentition.

Etiology.—Probably due to the poisonous products of decomposing and fermenting foods acting upon the system. The predisposing causes are hot weather, dentition, bad hygiene, the previous presence of some slight dyspeptic derangement, dyspeptic diarrhoea and entero-colitis.

Morbid Anatomy.—This is identical with the morbid anatomy of catarrhal gastritis and enteritis. The serous discharges and rapid collapse are due to the powerful irritation of the sympathetic system.

Symptoms—The disease is of sudden onset, setting in with incessant vomiting, which is excited by any attempt to take food or drink. The stools are copious and frequent, at first containing some offensive fecal matter, brown or yellow in color, later becoming thin, watery, serous and odorless. There is decided fever, reaching as high as 105 degrees; the temperature should be taken in the rectum, as the axillary temperature may be three or more degrees below that of the rectum; the pulse is rapid and feeble, ranging from 130 to 160. There is marked prostration from the onset, with pinched features, hollow eyes, depressed fontanelles, cold surface and ashy palor. The tongue is coated at first, but soon becomes dry and red, and thirst is intense. Even at this time a reaction may set in, but more commonly death results with symptoms of collapse and great elevation of internal temperature. In other cases there is restlessness, convulsions and coma. As

there is no cerebral lesion this condition is no doubt due to toxic agents absorbed from the intestines.

Diagnosis.—This is not difficult, as the constant vomiting, the frequent watery discharges, rapid emaciation and prostration and the hyperpyrexia are significant.

Prognosis.—Grave, even with the most favorable surroundings. Recovery is not impossible, much depending upon the promptness of treatment.

Treatment.—A change of air, complete rest, removal of all foods for a short time and absolute cleanliness are of great importance. Thorough treatment should be given along the entire spine, particularly to the splanchnics of the stomach and the intestines, and to the vagi nerves in the cervical region. Frequent bathing with cool water or better still, wrapping the child in cold, wet sheets, will reduce the hyperpyrexia.

Thorough cleansing of the stomach and intestines with warm water occasionally gives excellent results. In collapse the use of a hot bath, is indicated, followed by wrapping the child warmly in blankets and placing him in a horizontal position. The food of the child should consist of peptonized milk, raw beef juice, diluted egg albumin, barley water and chicken broth. Nourishment should be given gradually, and only after the intense symptoms have subsided.

ACUTE ENTERO-COLITIS.

Definition.—In this form the ileum and colon are chiefly affected, especially the lymphatic glands or lymph follicles.

Etiology.—Warm weather, the artificial feeding of children, dentition and bad hygiene are predisposing causes. The disease usually occurs between the ages of six and eighteen months, but it is not infrequent in the third or fourth year. This disease is not confined to the warm

weather, but may set in at any season of the year. Lesions in the spine occur from the eleventh dorsal to the fourth lumbar.

Morbid Anatomy.—The mucous membrane is congested and swollen, the solitary and agminated glands are swollen and often ulcerated. The changes may end here or the ulcers may enlarge and extend into the muscular coat with the separation of a slough. There may be infiltration and thickening extending into the submucous and muscular coats, followed by induration of the tissue producing abnormal rigidity.

Symptoms.—The disease may be a sequel of dyspeptic diarrhoea or cholera infantum. The temperature increases and the stools change in character, being at first yellow, and later green. They contain traces of blood and mucus, and are passed without pain. Vomiting may be present, but is not a constant symptom. The abdomen is distended and tender along the course of the colon. The disease may abate here, recovery from the condition being slow; or the symptoms may increase in severity with persistent small painful stools, mainly of blood and mucus, and with scanty urine. The child grows pale and emaciated, and assumes a senile appearance. These cases last five or six weeks, death being preceded by coma and convulsions; though a few recover. Relapses are not uncommon and should be guarded against.

Prognosis.—Grave; recovery follows prompt treatment with favorable surroundings.

Diagnosis.—Entero-colitis is distinguished from *dyspeptic diarrhoea* by the greater severity, more fever, greater prostration, the stools containing more mucus and even blood, and by the greater pain and suffering. *Cholera infantum* may be recognized by the abrupt onset, very high fever, constant vomiting, hyperpyrexia and an early collapse.

Treatment.—Attention should be given to the condition of the spine from the eleventh dorsal to the fifth lumbar. When the ileum and colon are involved disorder is usually present in the third and fourth lumbar vertebrae. Relaxation of all mucles in this region and correction of the vertebral lesions are essential.

Irrigation of the bowels once a day with a pint of cold water is very beneficial and even pieces of ice may be introduced into the rectum. Fresh, pure air, rest and cleanliness with a restricted diet and daily warm baths are important to the treatment. In a word, hygienic and dietetic treatment similar to that for acute diarrhoea should be employed.

CHOLERA MORBUS.

Synonyms.—Cholera nostras; sporadic cholera; English cholera; bilious cholera.

Definition.—An acute gastral intestinal catarrh of sudden onset; characterized by violent abdominal pains, incessant vomiting and purging.

Etiology.—This disease greatly resembles Asiatic cholera; so much so that one seems justified in suspecting that cholera morbus, like true cholera, is due to a specific organism. No single bacillus has yet been designated as the specific germ, although one has been recognized resembling very much the comma bacillus of true cholera. Until this has been fully decided, cholera morbus must be regarded as severe inflammation of the mucous membrane of the stomach and intestines, due to some poison generated from the improper food which seems to be the cause of the disease, such as indigestible fruits, cabbage and cucumbers. It is most prevalent in hot weather, but is also caused by exposure to cold and damp.

Morbid Anatomy.—The same as in catarrhal enteritis. In fatal cases of cholera morbus there is the same shrunken, ashen appearance of the skin that characterizes cholera.

Symptoms.—The onset is sudden, with intense cramps in the stomach and frequently in the lower limbs, nausea, vomiting, and purging of bilious material. Later it becomes almost like water and in severe cases the discharge becomes serous, finally resembling the ricewater discharges of true cholera. There is also intense thirst, moderate fever, rapid emaciation and loss of strength; the surface becomes cold and covered with clammy sweat, the pulse frequent and feeble. The patient becomes restless and anxious.

Diagnosis.—*Asiatic Cholera.*—There is no way of distinguishing between asiatic cholera and cholera morbus, except by examination of the discharges by an expert.

Similar attacks are produced in poisoning by arsenic, corrosive sublimate and certain fungi, and are only discriminated from it by clinical history and cause.

Prognosis.—In the majority of cases the prognosis is favorable, death rarely occurring. The duration is from twenty-four to forty-eight hours.

Treatment.—A strong inhibitory treatment to the gastro-intestinal nerves is at once demanded. This treatment should be kept up until relief is given. In some cases gentle treatment over the stomach and intestines quiets the distress. Inhibition at the occiput gives relief, especially to the nausea and vomiting. Hot applications should be applied to the abdomen.

The vomiting is relieved principally at the fourth and fifth dorsal vertebrae on the right side near the angle of the ribs Cold carbonated water and pieces of ice swallowed are useful. The diet must be regulated, the further after treatment being symptomatic.

INTESTINAL COLIC.

Synonyms.—Enteralgia; tormina; gripes.

Definition.—A painful spasmodic contraction of the muscular layer of the intestines.

Etiology.—Lesions of the splanchnics causing irritation of the sensory nerves to the intestines are the most common causes. The splanchnics also contain inhibitory and vaso-motor nerves to the intestines. Indigestible food, flatulency and impaction of faeces oftentimes produce intestinal colic. Foreign bodies, intestinal worms, abnormal amounts of bile discharged into the intestines, and reflex causes from diseases, as from the ovaries, uterus, liver, spine, etc., will produce the disorder. Also lead poisoning, syphilis, rheumatism, locomotor ataxia, chronic malaria and hysteria.

Symptoms.—Severe paroxysms of pain, centering around the navel and diffused throughout the entire abdomen. The pain is of a piercing, cutting and twisting nature, relieved upon pressure. The abdomen is distended and the patient restless and continually changing his position. The attacks alternate with periods of complete quietude. In severe attacks the features may be pinched and the surface cold, with feeble pulse, vomiting and tense abdominal walls, all indicating insipient collapse. The duration of the attack is from a few minutes to several hours, eased at intervals and usually ending by a discharge of flatus.

Diagnosis.—*Lead Colic.*—The slate-colored skin, blue line on the gums, sweetish metallic taste, constipation, slow pulse, retracted abdominal walls and lead in the urine will differentiate this disease.

Biliary Colic.—In this there is pain in the hepatic region radiating to the back and right shoulder; also jaundice, calculi in the stools and bile in the urine.

Nephritic Colic.—This is accompanied by pain radiat-

ing down one or both ureters to inner side of thigh with retraction of testicle of side affected, and blood, mucus, pus or calculi in the urine.

Uterine Colic.—Dysmenorrhoea, pain in the pelvis.

Ovarian Colic.—Extremely painful upon pressure over the ovaries; hysteria.

Abdominal Aneurism.—Tumor, pulsation, bruit.

Inflammatory and Ulcerated Disorders of the Abdomen.—Tenderness upon pressure, fever.

Prognosis.—Most favorable. Rarely a case terminates fatally.

Treatment.—Relief of pain is the first indication and is best accomplished by strong inhibition in the splanchnic region. If disorders of the spinal column are located it is of primary importance that they be corrected. In cases of irritations of the intestinal mucous membrane a contraction of muscles of the spine will be found according to the portion of the intestines involved, e. g., irritation of the mucous coat of the jejunum would cause contraction of muscles at the tenth and eleventh dorsals. It is merely a reflex sign and is one instance that would go to prove a double conductivity of nerve force, for on the other hand a lesion at the tenth and eleventh dorsals would produce colic or other disorders of the jejunum. The portion of the bowel affected, therefore, can be readily told by noticing the places of muscular contraction along the spinal column. Generally the jejunum and ileum are the portions of the bowel affected. Thus the pain can be controlled, if in the jejunum, at the tenth and eleventh dorsals; if in the ileum, at the twelfth dorsal; if in the ileo-caecal region including the vermiform appendix, at from the first to the third lumbar; if in the colon, at the third to the fifth lumbar; and if in the rectum, at the sacral and coccygeal nerves. Occasionally the duodenum and jejunum are

reached by nerves as high up as the fifth dorsal (usually vaso-motor nerves, not sensory) and the other portions of the bowel lower according to their respective positions. The relief is given by way of the splanchnics and sympathetics to the mucous (sensory) coat of the intestines.

Anterior treatment to the abdomen helps to relieve the contracted fascia of the mesentery with a consequent freeing of the circulation. It also aids peristalsis of the intestines and expulsion of the irritating material. Direct treatment to the abdomen for the peristalsis relieves also constipation, impactions and the enteralgia, the latter principally by firm pressure. Peristalsis is also increased by stimulation of the vagi and inhibition of the splanchnics. The latter treatment, of course, is not given to relieve pain directly, but to facilitate the removal of irritating substances if such are the source of trouble.

Flatulency when present can be relieved by direct pressure upon the solar plexus which apparently removes obstructions to the abdominal nervous system (particularly the nerves to the digestive glands, as fermentation and flatulency are due to a disproportionate secretion of digestive juices) and thus the gaseous formations are absorbed. Additional treatment to the lower dorsal vertebrae and lower ribs to relieve nerve lesions may be indicated.

As stated in the etiology of intestinal colic, the splanchnic nerves contain not only sensitive fibres to the intestines, but motor and vaso-motor fibres as well. The same is true of the vagi nerves; they exert upon the intestines not alone a motor influence, but also a blood control, consequently our work in a certain region can be for more than one purpose. Hot applications to the abdomen may be of aid. The diet should always be regulated for a few days at least.

CONSTIPATION.

Definition.—An unnatural retention of faeces from any cause.

Etiology.—The following list of causes may be assigned to this malady: A deficiency in the bile or other secretions that aid peristalsis; many acute and chronic diseases which lessen the secretions and impair peristalsis such as anaemia, hysteria, chronic affections of the liver, stomach and intestines and acute fevers; certain drugs and strong purgatives, stricture and concentracted food; sedentary habits and neglect of the calls of nature. Atony of the colon may also be caused by chronic disease of the mucosa and by general disease causing debility. There may be weakness of the abdominal muscles caused by obesity and the distention of frequent pregnancies, or obstructions caused by displaced organs and foreign bodies. Constipation is really a symptom in most cases of some disease; many times it is about the only symptom noticeable to the patient or manifested to the physician. One has to take into consideration the many causes that would produce constipation when the cure of a case is undertaken. Consequently a disordered structure may be found in almost any region of a body which would bear directly or indirectly in the causation of constipation.

In the majority of cases lesions will be found in the vertebrae of the lower dorsal and lumbar regions, or in the lower ribs of either side. The lesions may affect the vascular supply and innervations of the intestines directly, or the lesion may cause the constipation by affecting some other digestive organ first. Lesions to the vagi affecting the peristalsis of the intestines are very common.

Symptoms.—The ordinary symptoms are infrequent stools, debility, lassitude, headache, loss of appetite, anaemia, furred tongue and fetid breath. Serious symptoms

may result in long continued cases, such as piles, ulceration of the colon, perforation, enteritis and occlusion. The fecal masses may become channelled and diarrhoea may occur from the irritation. In long standing cases of constipation, if the patient suddenly develops diarrhoea the rectum should be well examined to see if there are impacted faeces present. Neuralgia of the sacral nerves may also be caused by impacted faeces in the sigmoid flexure.

Constipation in infants is caused most commonly by the diet, but it may be congenital. The regular habits should be insisted upon, as carelessness in this matter often brings on the most obstinate cases of constipation in later life. There may also be local causes such as disturbances of the normal secretions, impairment of intestinal walls due to inflammation, and mechanical obstructions caused by tumors, intussusception, twists, etc.

Treatment.—Naturally owing to the numerous etiological factors each case is a special study and the treatment is necessarily varied. Many cases will present slight impaction to the bowels, a sluggish liver, spinal lesion and so on which simply require a specific treatment and all the disorder will be removed. On the other hand constipation will be due to prolonged ill health of various kinds and thus require a careful systematic treatment not only of the bowels but of the entire system. Of primary importance in these cases is regulation of the diet, plenty of exercise, and regularity in going to stool at a fixed hour each day. The psychological effect of attention to the latter point in some instances will be sufficient to perform a cure. Too much cannot be said in regard to the beneficial effects of systematic habits.

Lesions may be found in the spinal column producing constipation from about the fifth dorsal to the coccyx, although principally the lower three dorsal and upper two

lumbar vertebrae are at fault. Constipation may be caused by defects at any point in the intestines and consequently the sections of the spinal column sending nerves through the intervertebral foramina to the several sections of the bowels should be examined. At any point from the fifth dorsal to the coccyx certain vaso-motor, motor and secretory nerves of the intestines may be affected by various lesions. The vaso-motor nerves keep up the vascular tone of the bowels, the motor nerves the peristaltic action and the secretory nerves attend to the intestinal juices. In constipation, disorders of the spinal column are generally found on the right side; why this is so I am unable to state. In those cases where the liver is impaired the answer might be because most of the nerves to the liver are on the right side, but I find the right side just as often affected when the lesions are in the lumbar region and the nerve supply to the hepatic region intact.

The vagi nerves have important bearing upon the motor apparatus of the intestines. Lesions in the upper cervical involving intestinal fibres of the vagi occur occasionally. Stimulation of these fibres increases the peristalsis of the intestines (stimulation of the splanchnics diminishes peristalsis).

The value of direct treatment over the intestines from the duodenum to the rectum in some cases of constipation cannot be overestimated. It aids peristaltic action, removes impactions, strengthens weakened muscles of the intestines and abdomen and in general gives tone to all of the abdominal organs. The treatment should not be given in a hap-hazard manner, but each move should be for a definite purpose. Care should be taken not to bruise the intestines or other organs, as by gouging or severe punching; the flat surface of the fingers and the palms of the hands should be used. Obstructions and impactions

of the gut, especially at the ileo-cecal and sigmoid regions should be carefully corrected. At all angles of the gut impactions and prolapsus may occur.

Direct treatment to the liver and biliary ducts are necessary in many cases as the bile is the natural purgative, and thus a slowness or inactivity of the liver and bile ducts might cause costiveness.

Some cases result from anaesthesia of the rectum, due to pressure of the fecal matter, collecting in the rectum. Simple dilatation of the rectal sphincters and a stimulating treatment through the sacral nerves will bring about a healthy activity of these parts. Occasionally the coccyx becomes displaced and produces paresis of the rectal nerves; or a displaced uterus or a tumor may produce the same result.

The use of proper food is essential. Coarse food leaves a great amount of residue and on the other hand dainty food leaves but little residue, both causing costiveness. The patient should drink considerable water. An enema occasionally is indicated and is a great aid when used, particularly in cases of paralysis of the intestines and in impactions.

Treatment of the Constipation of Infants.—Repeated small enemata at a fixed hour each day are probably the best treatment, as the proper manipulation, with regard to method and amount of force necessary, is impossible to be adjudged properly. Two ounces of tepid water at a time should be injected. Slight dilatation of the anus and massage to the abdomen will be useful.

INTESTINAL OBSTRUCTION.

Synonym.—Ileus.

Definition.—A sudden or gradual closure of the intestinal canal at any point. Closure of the gut may be caused

by *strangulation, intussusception, twists and knots, abnormal contents* and *strictures and tumors.*

STRANGULATION.

Synonyms.—Internal or external strangulation; constriction of the bowel; hernia.

This is the most frequent cause of acute obstruction of the bowels. There may be strictures of the bowels due to inflammatory processes producing bands or adhesions, or due to the adhesion of a bowel to an abdominal wound; a vitelline remnant, as a blood vessel may remain and act as a strangulating cord, or in Meckel's diverticulum one end may be attached to the mesentery or abdominal wall and thus form a ring through which the gut may pass and become strangulated.

Strangulation may take place in the foramen of Winslow or the foramen ovale, or between the pedicle of a tumor and the abdominal wall. Peritoneal pouches, mesenteric and omental slits, adherent appendix or fallopian tube and diaphragmatic hernia may be other causes. An external strangulation (hernia) may take place in the crural or inguinal canal, in the umbilicus, in the sacro-sciatic notch or in the opening through which the infra-pubic vessels pass. In strangulation there is a constriction of a portion of the bowel causing an arrest of the circulation of blood at that point and more or less of a stoppage of the fecal matter of the intestine. In ninety per cent of cases the strangulation occurs in the small bowel, in eighty-three per cent the strangulated part is in the lower abdomen and sixty-seven per cent occur in the right iliac fossa, according to Fitz.

INTUSSUSCEPTION.

Synonym.—Invagination.

Intussusception is the slipping of a part of the intestine

into another part, immediately below it, as the slipping of a part of a finger of a glove or a coat sleeve into another part. The portion involved may be anywhere from half an inch to a foot or more in length and the middle and inner layers increase at the expense of the outer layer. This produces compression and inflammation and impediment to the intestinal contents. It occurs principally in children and is more common in males.

Spasms of the intestinal muscles and perverted peristalsis are probably the most common causes. One part of the bowel may be dilated whereby an adjacent portion is contracted, thus allowing an invagination. Diarrhoea, habitual constipation and intestinal polypi are important exciting causes. Invaginations oftentimes occur before death, probably due to irregular peristalsis.

Following engorgement and inflammation of the invaginated portion a tumor is usually present and lypmh is thrown out which may cause the layers of gut to adhere together, so that the invaginated portion cannot be drawn out. Necrosis and sloughing is then likely to take place.

Intussusception varies according to location and is named according to the part of the bowel involved. There is commonly recognized (1) Ileo-colic, when the ileo-cecal valve descends into the colon. (2) Enteric of the small intestines. (3) Colic of the large intestine. (4) Colico-rectal of the colon and rectum. (5) Rectal of the rectum.

TWISTS AND KNOTS.

These occur more frequently in males usually between the ages of thirty and forty. In nearly all cases the twist is axial, accompanied by relaxed and lengthened mesentery. One portion of a bowel may be twisted about another or a loop of bowel twisted upon its long axis. A bowel being impacted or overdistended by faeces and gas

is quite likely to roll on its axis or knot and become dislocated by its weight and inactivity, thus producing compression and obstruction of the bowels. The volvulus commonly occurs in the large intestines at the sigmoid flexure and in the ileo-cecal and cecal regions. It occasionally occurs in the small intestines.

ABNORMAL CONTENTS.

Synonyms.—Abnormal contents and foreign bodies; fecal obstructions or impactions.

Obstruction may be caused by gall-stones, enteroliths, lumbracoid worms, certain medicines, such as magnesia and bismuth, fruit-stones, coins, needles, pins, buttons, etc., and fecal matter. Foreign bodies usually lodge in the ileo-cecal region and in the small intestine, while fecal impactions occur in the large intestine, more frequently in the lower part. Females are more subject to it than males.

Its causes are many and are similar to those of constipation. Spinal lesions are very frequent, probably causing paresis or paralysis of a segment of the bowel; or all the forces that maintain a normal activity of the intestines may become impaired. The impaction may be so large as to produce dilatation and weakness in the muscular coat of the involved portion of the bowel. The obstruction mass becomes very hard and dry and may become channeled, allowing some material to pass until finally a large piece of fecal matter will obstruct the passage completely. Principal points of obstruction are the ileo-cecal region, the sigmoid flexure, the colon and rectum. Dilatation of the sigmoid flexure, especially when congenitally long, may even be so great as to crowd up and interfere with the liver and diaphragm; in such cases the coats of the intestines are usually hypertrophied.

STRICTURES AND TUMORS.

These usually occur in adults, most frequently in women and generally involve the large intestine and lower part of the abdomen most of them occurring in the left iliac fossa. They are of much less importance than the causes of acute obstruction but they are common causes of chronic obstruction.

Strictures may be (1) Congenital, commonly causing complete occlusion, as is seen in the imperforate anus and defective union between the duodenum and pylorus. (2) Cicatricial stenosis, from ulceration produced by dysentery, typhoid fever, tuberculosis and syphilis. (3) New growths, from any of the benign tumors or from malignant tumors, chiefly cylindrical epithelioma about the sigmoid flexure. Tumors external to the bowels or in the pelvis may cause intestinal obstruction by compression.

Symptoms.—*Acute Obstruction.*—Constipation, nausea, vomiting and pain are the four important symptoms. The pain is of a colicky nature and may come on abruptly. After the contents of the stomach have been vomited the material becomes colored with bile and finally stercoraceous vomiting occurs. Observing the contents vomited (gastric, bile-stained and fecal) will be of great aid in the diagnosis. The contents of the bowel below the obstruction may be emptied or complete constipation may remain. All the symptoms, as a rule, rapidly grow more pronounced. The pain is more severe, tenderness occurs over the abdomen in limited areas, there is slight tympany, the eyes are sunken, and the skin is cold and clammy; the pulse is quickened and feeble, the urine highly colored; the tongue is dry, with incessant thirst, tenesmus and tumor may be marked and fever occasionally occurs. The above condition may continue from three days to a week when collapse and death occur, or the sufferer gradually regains health.

Chronic Obstruction.—In fecal impactions constipation of long standing is commonly observed. In some cases the fecal mass has become channeled allowing the bowels to remain open, the patient possibly not knowing that there is any trouble. In fact, diarrhoea may be present, due to irritation above the impaction. Finally, however, obstruction occurs; the breath is offensive, the appetite is poor, the abdomen swells, and there is fullness and weight within the abdomen, accompanied by pain and vomiting. Upon examination before complete closure the fecal impactions can easily be felt through the abdomen externally. The osteopathic physician has very little difficulty in locating the fecal matter at any time. His sense of touch is so thoroughly educated that any slight tumor or an abnormality would scarcely remain unfound whether it be in the right iliac fossa, the ascending colon, the hepatic flexure, the transverse colon, the sigmoid flexure, or at any other point. Other symptoms may be present as hiccough, jaundice, tenesmus, tumultuous peristalsis, local peritonitis and collapse. In stricture caused by cicatrices that may have been formed years before complete obstruction takes place. Transient attacks oftentimes occur. Usually the general health is greatly impaired, long before complete occlusion.

Diagnosis.—The osteopath has great advantage over other school practitioners in diagnosis. His ability to feel and ascertain accurately the condition of the abdomen is of great value in intestinal obstructions. A diagnosis can usually be made by careful, thorough examination through the abdominal wall, in connection with the symptoms, and the physical signs; the region of bowel troubles being manifested externally along the spinal column by contracted muscles at a certain point corresponding with the particu-

lar portion of the bowel involved, as indicated under *intestinal colic.*

Intestinal obstruction may be confounded with tumors, intestinal colic, enteritis, peritonitis, hepatic colic and renal colic.

Peritonitis may be differentiated by the history, the early fever, diffused tenderness and absence of fecal vomiting.

When *invagination* occurs, besides the symptoms of obstruction the age, tenesmus, bloody discharges and the sausage shaped tumor in the line of the colon will be diagnostic.

In *stricture* the history, gradual onset, and ribbonlike and bloody stools will distinguish that disorder.

In *tumors* the gradual onset, age, bloody discharges and cachexia will be important symptoms.

Treatment.—Treatment of the bowels directly is required and each case must depend for its relief upon the ingenuity of the physician. Rules to be followed can not be given, as cases vary in manner of involvement and in location, consequently the correction of the disorder depends as much upon the ability of the osteopath as does the determination of the diagnosis. Taxis is the method commonly used in relieving intestinal obstructions, though other methods may be employed.

In invagination raising the buttocks and lowering the chest, with thorough injection of oil, sugar water or tepid soapsuds or an inflation of the colon with air may give relief. In addition to thorough manipulation of the bowels in impactions, irrigation of the lower bowel with warm water, soapsuds or glycerine and water will usually be of material aid. In strangulation high injections of warm water and assuming the knee, elbow or lateral position may straighten out the acute obstruction. Twists and knots are best relieved by direct treatment, although injections

may be of aid. Tumors and strictures will require sooner or later surgical interference in most cases, but to treat as in impaction will be effective for a short time at least.

Besides the ordinary treatment for the nausea and vomiting, washing out of the stomach will help allay such disorder, quiet the peristalsis and relieve the abdominal distention and pressure above the seat of obstruction.

Strong thorough treatment of the spinal nerves to the stomach and intestines will be of great help in lessening pain, establishing normal peristaltic action and in suppressing inflammation. The vagi also should be treated for perverted peristalsis.

The nutrition of the patient is best retained by rectal injections of peptonized food and defibrinated blood. If there is no indication of immediate relief within three days of the onset in acute cases. laparotomy should be performed without delay.

Hernia.—There are several methods to reduce a hernia. The first endeavor in every instance must be to reduce it, whether it be strangulated, incarcerated or simply protruded. One of the easiest and commonest methods is to place the patient on his back, the buttocks elevated, the legs flexed upon the thighs, the thighs flexed upon the abdomen and the limb on the affected side slightly rotated inward so that the columns of the ring about the hernia may be relaxed. After the hernia is protruded a little more so that its contents may be emptied readily, a gentle pressure with the thumb and finger is made upon the upper part of the tumor, when the rest will follow. A gurgling noise is heard upon reduction. Cases that can not be reduced and are causing acute obstruction of the intestines should be treated surgically.

APPENDICITIS.

Synonyms.—Typhlitis; perityphlitis.

Definition.—An inflammation of the appendix vermiformis, either catarrhal, ulcerated, or interstitial, involving the surrounding tissues and leading to perforation and peritonitis.

Pathology and Morbid Anatomy.—*Catarrhal Appendicitis.*—In mild cases the same conditions undoubtedly exist as in catarrhal affections in other portions of the intestines. In severe cases there is detachment and partial destruction of the follicles of Lieberkühn with infiltration of round cells into the walls and shedding of the epithelium of the mucosa. A granular surface is left following the shedding of epithelium, the retiform tissue becomes more closely infiltrated with leucocytes and the entire condition favors attacks of pathogenic bacteria, thus leading to septic and chronic peritonitis; or there may be a union of the granulating surfaces with obliteration of the lumen of the appendix. A natural cure is effected by the obliteration and the condition rendered immune against further attacks.

Ulcerated Appendicitis.—There is localized ulceration in the wall of the appendix and the mucous and submucous coats are more or less destroyed; in fact, perforation may follow. It may be associated with a concretion of foreign bodies or it may be the result of micro-organisms of typhoid fever or tuberculosis. Faecal concretions and foreign bodies may be present in the appendix without causing the slightest harm, but in a majority of cases they are a source of irritation.

Interstitial Appendicitis.—This form may succeed either of the other forms; or the infection may be primary, taking place through the lymphatics. If it succeeds the other forms the disease starts on the abraded surface; if primary, it starts in the wall of the appendix. The wall of the

appendix is the seat of a necrosis and frequently of gangrene, in which case the organ becomes very large. Upon perforation of the appendix a most virulent type of peritonitis occurs on account of the invasion of the peritoneum by the faecal matter set free by the ruptured intestine and containing countless numbers of bacteria.

Appendicitis is nearly always due to injury of the innervation of the vermiform appendix and immediate region by vertebral dislocations or sub-dislocations from the second to the fourth lumbar. The vermiform appendix is a peculiarly constructed organ, and its function has not been determined with positiveness. It undoubtedly has a function and possibly a very useful one. Although the organ has been found in various localities of the abdomen, that fact does not necessarily indicate that it is a functionless relic. It is richly supplied with lymphatics and blood vessels and has a peristaltic action peculiar to itself. When the organ is in perfect condition foreign material probably would not find a lodging point in it on account of its peristalsis. Appendicitis may also be caused by faecal impactions and foreign bodies. Thus in various instances abrasions of the coats of the tube occur or the innervation or vascular supply is impaired; and pathagenic bacteria, as baccilli coli communis, streptococci pyogenes, staphytococci pyogenes aurei, typhoid baccilli, tubercle baccilli and others, find a favorable lodging point and determine the nature of the disease.

Etiology.—As shown above, injuries to the spinal column and displacements of the vertebrae in the lower dorsal and lumbar regions, straining and lifting, torsion of the appendix, traumatism, impaction of faeces, concretions, and foreign bodies, acute indigestion, indigestible food, overeating, exposure to wet and cold, and infectious diseases, as typhoid

fever, tuberculosis and influenza, are all in the list of causes of appendicitis.

Symptoms.—A sudden violent pain in the abdomen, usually localized in the right iliac region although at first this pain may be general. There is localized tenderness in the appendix region, usually found upon slight pressure. The point of greatest tenderness is detected over McBurney's point—a point at the intersection of a line between the umbilicus and the anterior superior iliac spine, with a second drawn along the outer edge of the right rectus muscle. The patient usually lies on the back with the right leg drawn up.

There is always fever at the onset, the temperature being from 100 to 102 or even 104 degrees F., rarely higher, and very rarely preceded by a chill. In favorable cases the temperature gradually falls reaching normal in from five to seven days. If suppuration takes place the temperature continues with but slight fall, although in some cases there is a rise, or it may become almost normal. Pain in the right iliac fossa, without fever, rarely points to an acute attack of appendicitis. The tongue is usually furred and moist and in advanced stages dry. Vomiting and nausea are more or less frequent, and more commonly present in the event of perforation or rupture of abscess. This is regarded as a reflex symptom. In favorable cases vomiting rarely lasts beyond the second day. In the majority of cases constipation is present from the beginnig of the attack, due to paralysis of the bowels. There may be diarrhoea particularly in children, and there is a loss of appetite.

On inspection of the abdomen at the onset of the attack both sides look alike, but on palpation there is rigidity of the rectus abdominis muscle and the other muscles overlying the seat of inflammation. The whole abdomen may be slightly distended. In the majority of cases there is a

progressive development of a hard swelling or tumor in the right iliac fossa. These tumors vary in size, but are usually oval and the size of a hen's egg, and generally situated a little above Poupart's ligament. There is often great irritability of the bladder and frequent micturation, the urine being scanty and often containing indican, but rarely albumen. A sudden fall in the temperature often indicates that a perforation has taken place, or that a small abscess is ruptured into the intestines. In favorable cases the temperature falls at the end of the third or fourth day, the pain lessens, the tongue becomes clearer and the bowels are moved. In other cases there may be slight fever present and it may be two or three weeks before the patient convalesces. If the tumor persists, the patient is very liable to have a recurrence of the condition.

Rapid growth of the tumor and aggravation of the several symtoms point to suppuration, especially extreme tenderness over the point of inflammation. As a rule the fever rises at the onset of suppuration, but this is not always the case. If the appendicitis goes on to suppuration it usually terminates by rupture into the peritoneum, general peritonitis sets in and death is the result. In a few cases the abscess may rupture into the bowel, in which case the patient recovers. Abscesses situated deeply in the pelvis in rare cases break into the bladder, others discharge externally by breaking through the groin, or they may burrow in various directions and prove fatal by perforating into an artery or vein. Other terminations are lumbar abscess, hepatic abscess and perinephritic abscess. Death may be caused by septicaemia or pylephlebitis. These events may be delayed a variable length of time depending upon the extent and strength of the adhesions that form about the abscess.

The symptoms resulting from general peritonitis due to

the rupture of the abscess into the peritoneum are the same as those presented by that disease when due to any other sudden cause. The onset is sudden and the pain diffuse, not always localized in the right iliac fossa. The intense severity of symptoms from the onset makes one suspicious of general peritonitis. The abdomen is distended, and there is diffused tenderness, accompanied by a rapid pulse and dry and coated tongue. At the onset there is moderate fever, which by the third or fourth day becomes normal or subnormal. The symptoms of collapse are shown when the patient lies on the back with his knees drawn up, face anxiously pinched, a cold clammy skin and feeble pulse.

Relapsing Appendicitis.—There is great liability to relapses in appendicitis, the attacks may recur for years at different intervals. In some cases these intervals are very short. In various cases perfect recovery may take place after repeated attacks. It is certain that one attack predisposes another.

The morbid condition may be an obliterated appendicitis with or without adhesions and occasionally the appendix is perforated by a small abscess which is surrounded by fibroid tissue. The appendix also may become adherent.

Complications and Sequelae.—Obstruction of the bowels is the most important; this is due to constriction caused by the adhesions which take place during the course of the peritonitis, and is sometimes the cause of death. There may be hepatic abscess due to thrombosis, or sometimes to emboli from branches of the portal vein; and these abscesses sometimes perforate the diaphragm causing empyema and pyopericardium. Very rarely pyaemic abscesses in the brain and lungs and throughout the system have been found.

Diagnosis.—In many cases the diagnosis is easy, but other cases require careful study and close observation. Sudden pain becoming localized, tenderness and rigidity in the right iliac region are three symptoms that together almost positively indicate appendicitis. A *pseudo-appendicitis*, with all symptoms of true appendicitis in the initial stage may be caused by the downward dislocation of the twelfth rib on the right side and occasionally the eleventh rib on the same side. The rib lies obliquely downward toward the crest of the ilium. In a few cases the obliquity of the lower rib is so great as to very nearly touch the ilium. The dislocated rib may produce severe irritation, pain, tenderness, rigidity and even inflammation of the abdominal muscles. The patient nearly always complains of the pain being deeply seated, thus possibly confusing one.

Typhoid Fever.—A gradual development of the fever, characteristic temperature curve, spots at the eighth day, enlargement of the spleen, epistaxis and diarrhoea will indicate typhoid fever.

Intestinal Obstruction.—The absence of fever and intermittent pain in the abdomen, with complete constipation, fecal vomiting, general distention of the abdomen, bloody stools and marked tenesmus would determine intestinal obstruction.

Tubal Disease.—The gradual onset, the duller and more constant pain, the history and pelvic examination will easily differentiate this disorder from appendicitis.

Biliary Colic.—In this the pain is higher up along the biliary ducts and gall bladder, extending even as high as the shoulder; and jaundice is generally present.

Renal Colic.—The pain extends along the ureters down to the inner side of thigh and testicle, and back into the lumbar region. There is absence of fever and rigidity.

Perinephritic Abscess.—Here there is pain downward in-

to groin as in nephritic colic and tenderness of the lumbar region. Exploratory incision may be necessary.

Prognosis.—Naturally the prognosis depends upon the form of appendicitis, but on the whole the prognosis is favorable. A large proportion of cases recover. Surgical operations are many times deferred until too late, undoubtedly on account of the uncertainty of the condition. Still on the other hand I have seen serious cases recover under the proper treatment where an operation seemed almost absolutely necessary, all going to prove the fact that very much depends upon the diagnosis.

Treatment.—Confine the patient in bed at once. Cases have undoubtedly been lost by not enforcing this point. Attempt should be made to correct the disordered condition of the lumbar region (second to fourth lumbar). Thorough and careful treatment should be given at this point, and in most instances the pain can be relieved by correction of the disordered vertebrae. If the case is seen at the beginning of the attack, thorough manipulation over the right iliac fossa and local application of ice is indicated. When the case is advanced extreme care should be used in manipulating over the swollen and inflamed region. Hot applications will be helpful in such instances.

When due to fecal impactions and foreign bodies thorough direct treatment over the involved region and high rectal injections are indicated. Treatment of the spine is necessary in all cases to relieve pain, to correct the nerve and vascular supply and to increase peristalsis so as to remove irritating bodies from the vermiform appendix.

The case should be most carefully watched, and a surgeon should be promptly called for consultation if the occasion demands it in the least; and if thought advisable, operation should be resorted to before too late. The pa-

tient should be nourished on a restricted diet of milk and animal broths.

DISEASES OF THE PANCREAS.

PANCREATITIS.

Synonym.—Inflammation of the pancreas.

Acute pancreatitis is usually divided into haemorrhagic, suppurative and gangrenous.

Etiology.—Traumatism producing haemorrhage, injuries of the lower dorsal and upper lumbar vertebrae, inflammatory derangements of the stomach and intestines, and inflammation extending from the duodenum to the pancreas by way of the pancreatic duct, are among the etiologic factors. Alcoholism may be a predisposing factor. Most cases occur after the thirtieth year of age.

Morbid Anatomy.—*Haemorrhagic Pancreatitis.*—In this there is enlargement of the pancreas, especially of its head. The entire organ is very much infiltrated with blood and many haemorrhagic foci occur, alternating with points of fat necrosis. The tissues surrounding the pancreas, the mesentery and omentum may be invaded by the haemorrhage.

Suppurative Pancreatitis follows the haemorrhagic form when recovery does not occur or when gangrene does not supervene. The entire organ is congested. Small abscesses or diffused suppuration takes place with more or less peritonitis about the adjacent organs.

Gangrenous Pancreatitis.—This condition follows the haemorrhagic form. The two forms heamorrhagic and gangrenous pancreatitis may be associated, or about the fourth day gangrene of part or of the whole of the organ occurs. The organ is of a dark softened shreddy consistency.

Symptoms.—Indigestion followed by abdominal pain are the general initial symptoms. The pain may be localized over the pancreas or diffused through the abdomen, followed by tenderness, swelling and tympany of the upper abdomen. Vomiting and constipation may be present. The temperature is usually subnormal but may be elevated. Fatty stools, mellituria and a palpable tumor may be found. Rarely a recovery occurs, death usually taking place within three or four days, or if not, the organ becomes gangrenous. With this form occurs abdominal tenderness and swelling, jaundice, chills and fever and probably collapse and death.

Death usually occurs within seven or eight days. If the patient continues to live, suppurative pancreatitis occurs with the additional symptom of epigastric peritonitis, high fever and chills with periods of remission.

Diagnosis.—This disease is to be distinguished from acute intestinal obstruction, perforation of the stomach and bile ducts and from irritating poison.

Prognosis.—In the haemorrhagic form the prognosis is unfavorable. In the gangrenous form very unfavorable, while the suppurative form is fatal.

Treatment.—The treatment is applied chiefly through the splanchnic nerves of the dorsal and first lumbar and the right vagus. Direct treatment of the abdomen anteriorly about three inches above the umbilicus, to manipulate the gland itself and to stimulate the coeliac and left semi-lunar ganglia, is effective.

Besides the preceding, the treatment of peritonitis is indicated in haemorrhagic pancreatitis. Surgical and palliative treatment of the other forms are indicated. Great care should be used in treatment over the abdomen, as subects of pancreatic diseases are generally greatly emaciated and bruising of the abdominal organs could easily occur.

The pancreative juice is the most important of all digestive fluids as it has a most vigorous action on all foods, consequently the dietetic treatment should consist in the administering of milk, beef peptonoids, egg albumin and pancreatized meats.

DISEASES OF THE LIVER.

HYPERAEMIA OF THE LIVER.

Definition.—An abnormal fullness of the blood vessels of the liver followed by an enlargement of that organ. It is active when arterial, passive when venous.

Etiology.—*Active hyperaemia* is usually due to indiscretions in diet. After each meal a physiological hyperaemia of the liver occurs which is greatly increased by over-eating and over-drinking habitually. This condition may lead to functional disturbance and possibly to organic change. Habitual constipation, malaria, heat and arrested menstrual epoch and infectious fevers are causes of the active form.

Passive hyperaemia is due to obstructions of the venous circulation. Valvular heart disease is the most common cause. Lung diseases, as emphysema or cirrhosis; obstruction to the vena cava or causes interfering with the flow of blood through the liver; and diseases of the pleura, are all among the causes.

Many cases of congestion of the liver present lesions to the vaso-motor nerves of the liver, fifth to ninth dorsals. Especially are the ribs over the liver apt to become displaced and cause hepatic hyperaemia.

Morbid Anatomy.—The liver is enlarged and engorged with blood. The appearance of the organ depends upon the duration of the hyperaemia. In passive hyperaemia the central portion of the lobule and the area of the hepatic

vein is deeply colored. The periphery and the area of the portal vein is palé. This alteration of the dark and light color gives rise to the nutmeg liver which is so noticeable upon section. In cases of long standing, atrophy of the liver cells and overgrowth of connective tissue results.

Symptoms.—*Active Hyperaemia.*—Dull aching and a sense of fullness in the right hypochondrium, aching of the limbs, coated tongue, nausea, vomiting, constipation, high colored urine and slight jaundice.

Passive Hyperaemia.—The symptoms are the same but less marked. The onset is gradual and the liver may attain considerable size. In severe cases following tricuspid regurgitation the liver may pulsate.

Diagnosis.—Active hyperaemia is occasionally confounded with catarrhal jaundice. Usually congestion of the liver is easily diagnosticated.

Prognosis.—In active hyperaemia the prognosis is good unless repeated attacks lead to atrophic degeneration.

In passive hyperaemia the prognosis depends entirely upon the cause.

Treatment.—*Active hyperaemia.*—The treatment consists in measures which tend to diminish the congestion, principally a thorough direct manipulation over the liver by raising and spreading the ribs over the liver. Careful and thorough treatment to the dorsal splanchnics of the liver is also indicated. The substitution of a scanty for a heavy diet is essential; the foods given should be such as are easily digested, as milk and broths; fats and sugars are to be avoided.

Passive hyperaemia.—The treatment consists of correcting the disorder causing it. Usually heart diseases are the cause. A thorough depletion of the bowels will aid largely in relieving ascites that may follow passive congestion (see ascites).

CATARRHAL JAUNDICE.

Synonym.—Inflammation of the common bile duct.

Definition.—Jaundice due to inflammation of the terminal portion of the common duct, not the result of impacted gall-stone.

Etiology.—A frequent cause is the dislocation of the tenth rib on the right side, thus interfering with the innervation to the bile ducts. Extension of gastro-duodenitis into the common duct may be a cause. Duodenal catarrh usually follows errors in diet, exposure, malaria, Bright's disease, portal obstruction and chronic heart disease. Infectious fevers, as pneumonia and typhoid fever, and emotional disturbances are among the causes. Catarrhal jaundice may occur in epidemic form.

Morbid Anatomy.—The duodenal end of the duct is most commonly involved. The mucous membrane is swollen and the orifice fills with mucus. The inflammation may involve the common and cystic ducts and even the hepatic.

Symptoms.—The symptoms present may be simply the jaundice. There is always soreness and tenderness over the ducts that can be felt upon pressure. The patient many times complains of a stabbing pain when pressure is exerted over the duodenal opening. Usually the course of the bile duct can readily be felt upon deep pressure owing to the tumefaction. Accompanying this condition may be general malaise, loss of appetite, nausea, vomiting, constipation or irregular action of the bowels, pains in the back and limbs and a slight fever.

Diagnosis.—Where jaundice is present without pain it generally indicates catarrhal jaundice. The absence of emaciation or of evidences of cancer or cirrhosis usually makes the diagnosis easy. Good general nutrition and a negative physical examination favor simple jaundice as to the diagnosis. There would be a diagnosis of catarrhal

jaundice in the presence of symptoms of gastro-intestinal catarrh or any infectious disease.

Prognosis.—The prognosis of catarrhal jaundice is favorable unless accompanied with infectious diseases or hypertrophic cirrhosis. Where diseases are associated with jaundice the danger is only from the disease. The duration of the disease is generally given from four to eight weeks, but osteopathic treatment usually lessens that time at least onehalf.

Treatment.—The treatment is directed toward relieving the inflammation of the bile ducts and increasing the flow of the bile into the intestines.

Great relief to the patient will be experienced from thorough treatment over the bile ducts especially at the duodenal end. Press slowly but firmly over the region of the ducts, then execute a downward motion with firm pressure over the course of the ducts. This performance should be repeated several times, until the tenderness is almost or entirely relieved from this region. The idea of this treatment is first to slowly but firmly bear down upon the abdominal muscles over the ducts so as to relax the tissues and get as close to the ducts as possible, and second, with the downward movements to reduce the congestion of the ducts and at the same time to remove any mucus or material from the orifice of the duct, thus allowing a freer flow of bile. Care should be taken not to gouge or dig into the ducts with the ends of the fingers, but to use the flat surface of the fingers. Any gouging or severe treatment would not allow one to accomplish his purpose, owing to the stimulus or irritation it would give the abdominal muscles and thus cause them to contract; and furthermore, it would more or less bruise the parts. An inhibitory treatment is occasionally given along the spine on the side

affected to help relax the abdominal muscles before this treatment is administered.

Direct treatment is given to the liver by more or less kneading or working the liver and also by raising and spreading the ribs over the liver. This treatment is to stimulate the activity of the liver. Reaching under the cartilages of the eighth and ninth ribs on the right side and bearing inward and downward will empty the gall-bladder and thus be of aid in relieving the tension in the biliary passages. It is probably a stimulus to these cutaneous fibres that causes a relaxation of the sphincter muscles of the gall-bladder and thus allows its emptying. Stimulation of the 10th nerve contracts the gall-bladder. When all of the muscles of the hepatic region have been carefully relaxed and softened a thorough examination can then be made of the vertebrae and ribs that might embarrass the innervation or vascular supply of the liver. Lesions of the vertebrae and ribs affecting the liver may occur from the sixth to the eleventh dorsal. Lesions to the vagus and phrenic nerves may occasionally involve the liver.

Irrigations of the large bowel with cold water has been practiced. The cold is supposed to excite peristalsis of the gall-bladder and ducts and thus aid the expulsion of the mucus. Drinking freely of alkaline mineral water will be helpful. A non-stimulating diet must be given. The stomach may not be in a condition to bear solid food; and furthermore, food on entering the duodenum will increase the local inflammation of the common bile duct. Give diluted milk, buttermilk, light meat broths, clam-broth, egg albumen and pressed beef juice. After the pain, vomiting and fever subsides, the diet can be gradually increased.

JAUNDICE.

Synonym.—Icterus.

Definition.—Jaundice is a symptom and not a disease. It consists of the discoloration of the skin and other tissues by material derived from the bile. The discoloration may vary from a mere paleness to a yellow or brown olive hue. Being a prominent symptom in many diseases of the liver it merits separate consideration.

Etiology.—There are two forms of jaundice (1) hepatogenous—caused by a suppression of the function of the liver cells as found in acute yellow atrophy, malaria, pernicious anaemia and certain fevers; and (2) haematogenous—due to disintegration of the blood.

There are various causes of jaundice. The immediate cause is a deposit in the skin of pigment. Obstruction by foreign bodies, as gall stones and parasites are important causes. Inflammation and swelling of the biliary ducts and duodenum is quite a common cause as well as stricture of the duct by tumors and various growths either internal or external to the biliary ducts. In some instances pressure from without by the pancreas, stomach, kidneys, enlarged glands, fecal matter, a pregnant uterus, etc., has been the cause of jaundice. Irritations and obstructions of the splanchnic nerves due to lesions in the lower dorsal vertebrae and the ribs from the seventh to the tenth will affect the liver markedly by lowering the blood pressure in the liver, so that the tension in the smaller bile ducts is greater than in the blood vessels. Also lesions at these points might cause inflammation and tumefaction of the bile ducts.

Symptoms.—*Hepatogenous.*—This form may be found at all ages, usually though in children. Besides the coloration of the skin there is itching of the skin on account of bile pigment deposits; even eruptions may occur. The mucous membranes are often colored and a constant

symptom is the bright yellow coloration of the sclerotic coat of the eye. Sweating is common and localized in the abdomen and the palms of the hands.

The secretions are colored with the bile pigment. It may be noticed in the urine before being apparent in the skin or conjunctiva. The perspiration is colored; rarely the saliva, tears and milk are colored; and oftentimes the expectoration is tinted.

As no bile passes into the intestine, the faeces are pale gray or slate gray color and usually fetid and pasty. The bowels are generally constipated but diarrhoea may occur owing to decomposition resulting from absence of the natural antiseptic ingredient. Other symptoms may be associated with the gastro-intestinal derangements, as nausea, fetid breath and loss of appetite. A slow pulse may occur due probably to some stimulating effect on the inhibitory action of the vagus nerve. In fact, lesions often occur at the atlas and axis affecting the vagus. Pain back of the right scapula is a symptom of liver trouble; it has been suggested that is due to a stimulus passing up the vagus to the spinal accessory, and thence to the trapezius muscle.

Various cerebral symptoms may be present, as great depression of spirits, irritability, headache and vertigo. Vision is variously affected. Owing to the various ingredients of the bile gaining entrance to the blood grave nervous symptoms occasionally are manifested, as sudden coma, delirium and convulsions, attended by fever, rapid pulse and dry tongue, the symptoms of the so-called "typhoid state."

Haematogenous.—The destruction of blood in this form is due to some toxic agent in the blood. The faeces are not clay colored and the urine is less stained with bile. Among the diseases causing this form are acute yellow

atrophy, yellow fever, bilious fever, typhus and typhoid fevers, pyaemia and snake poison.

Diagnosis.—To mistake for jaundice the dirty yellowish discoloration of the skin commonly termed *sallowness* is an error often made. This condition indicates malaria, uterine disease or general ill health. Very likely it is an anaemia and is readily diagnosed from the jaundice as the secretions and conjunctiva are not stained.

Addison's disease somewhat resembles jaundice, but the faeces are normal; the urine and sclerotic coat are not colored, but exposed portions of the body and the flexures of the joints are deeply stained.

Prognosis.—Depends entirely on the cause producing it. Ordinary cases run from two to six weeks, while others may not recover for several months. Jaundice from impaction of the bile ducts may be manifest for only a few days. The haemotogenous form usually terminates fatally owing to the disease causing it.

Treatment.—The treatment for the different forms resulting secondarily will be found under the diseases causing them. A simple icterus caused by disturbance through the innervation of the liver and bile ducts directly can be relieved readily by thorough treatment of the liver and bile ducts as described under catarrhal jaundice. Carefully raise the intestines if they are prolapsed, especially the colon.

ICTERUS NEONATORUM.

Synonym.—The jaundice of the new-born.

Jaundice of the new-born is a common disease in foundling hospitals and occasionally occurs in private practice. The heptatogenous form is simple and harmless, very likely due to obstructive causes. It runs a course of from a few days to a few weeks.

The haematogenous form is a grave condition and is generally fatal. Following the severance of the central circulation the tension in the bile capillaries is greater and the pressure in the portal vessels lower, thus allowing an absorption from the bile capillaries. Possibly in a few cases a patulous ductus venosus occurs allowing some of the portal blood containing bile to flow into the systemic circulation. The hepatogenous form may be associated with absence of the common hepatic duct, with common syphilitic hepatitis or septic phlebitis of the umbilical vein.

Treatment.—In the new-born infant the simple form of jaundice requires no treatment. The only aid in the graver form that can be given is in that condition due to syphilis requiring the treatment of the tertiary form.

ABSCESS OF THE LIVER.

Synonym.—Suppurative hepatitis.

Definition.—A diffused or circumscribed inflammation of the cells of the liver resulting in suppuration.

Etiology.—Suppuration within the liver, in the parenchyma or blood or bile passages, may be produced by any of the following causes:

(1) The amoeba coli of dysentery is transferred from the intestines into the liver.

(2) Traumatism is sometimes the cause. The injury is generally in the hepatic region; thus developing a traumatic abscess infected from the blood.

(3) Foreign bodies and parasites, such as gall-stones, retained bile which causes suppuration of the bile passages, hydatid cysts and in rare cases foreign bodies (as needle or fishbone) from the stomach pass into the liver, lodging there and exciting an abscess.

(4) Septic emboli. Nearly all the abscesses of the liver may be traceable to microbic origin. They may come

through the hepatic artery, but more often reach the liver through the portal vein, which brings septic emboli from ulcers of dysentery, typhoid fever, typhlitis, or from gastric ulcers. There may be an embolus which arises in the left heart, reaching the liver through the hepatic artery. Even an uninfectious embolus may be the cause of an abscess by coming in contact with pyaemic organisms brought to the liver through other channels and lodging there. These emboli mostly originate in the lungs and left heart or arise beyond if they are small enough to pass through the capillaries of the pulmonary artery. In fact these embolic or pyaemic abscesses may be caused by infection in the area of the systematic circulation and carried through the portal vein or hepatic artery. The emboli may even instead of passing through the lungs at all reach the liver through the inferior vena cava. Much more commonly however infection is brought through the portal vein from ulcerative infections of the bowels in dysentery, appendicitis, rectal affections, abscesses of the pelvis and sometimes after typhoid fever. These conditions produce a purulent inflammation of the portal vein (suppurative pylephlebitis).

Morbid Anatomy.—The right lobe is the most frequent seat of abscess, more toward the convexity than toward the concave side. The abscess may be single or multiple and varies in size. It may be very small, or it may convert the whole right lobe into an abscess cavity. The liver is proportionately enlarged and rarely the abscesses communicate with one another. Although the liver is enlarged the external appearance may be unchanged, but if the abscess is near the surface there may be a prominence and fluctuation may be recognized. Sometimes the liver adheres to the viscera or abdominal wall. The walls of the abscess cavity are usually ragged and have no definite limiting

membrane. But in chronic cases the abscess wall may be firm and thick.

Septic or pyaemic abscesses are always multiple. The liver is uniformly enlarged and on section there may be found what looks like solitary abscesses, but it will be found upon examination that they communicate and that probably the entire portal system in the liver is involved.

Symptoms.—Hepatic abscess is marked by fever, high in the evening and low in the morning, resembling very much intermittent or remittent fevers. There is pain usually in the hepatic region, fever of a septic type, chills, sweats, and slight jaundice, marked jaundice being rare. The liver becomes enlarged and if the abscess is near the surface there may be bulging and fluctuation, limited tenderness and throbbing. This enlargement is usually upward into the mammary and mid-axillary regions rather than downward. The enlargement is most marked in the right lobe. This enlargement is not entirely due to the presence of pus, but also to the swelling of the cells and to hyperaemia. Constipation may occur or there may be diarrhoea, which is important in the diagnosis as amoebae are found in the stools. The abscess may burst into the lungs, pleura, intestines or stomach or it may perforate externally, occasionally breaking into the pericardium.

Diagnosis.—At first abscess of the liver may be mistaken for intermittent fever. But if there is no history of malarial exposure and no enlargement of the spleen and then if the abscess opens externally it is sometimes difficult to tell whether it might not be an abscess in the abdominal wall.

It is sometimes confounded with intermittent hepatic fever of gall-stones or impacted calculus, but in that case there will be a history of hepatic colic, and jaundice is much more marked. It must be remembered that abscess of the liver is invariably secondary to dysentery, or suppu-

rative disease in some part of the body as from ulceration of the rectum or stomach.

Prognosis.—Generally unfavorable, over fifty per cent of cases being fatal. Even in cases where the abscess is near the surface and is opened recovery is rare.

Treatment.—The treatment is largely surgical, but cures can at times be performed by thorough treatment of the dorsal liver splanchnics, and by treatment of the pneumogastric, as it contains a great many of the vaso-motor nerves to the liver. The phrenic and the sympathetic by way of the inferior cervical ganglion form part of the innervation of the liver. The case must be watched most carefully; to determine the cause will be the most valuable aid in deciding on the treatment requirerd.

HEPATIC CANCER.

Synonym.—Carcinoma of the liver.

Etiology.—Hepatic cancer occurs next in frequency to that of the uterus and stomach. Severe dislocations of the vertebrae and ribs corresponding to the liver splanchnics are usually found on examination. These lesions may affect the vaso-motor nerves to the blood vessels or lymphatics of the liver, or possibly the trophic nerves to the liver tissues are involved. Certain micro-organisms are probably the exciting factors. Possibly heredity may be a cause. The disease may be secondary by extension from other organs. It is usually found in males between the fortieth and the sixtieth years.

Morbid Anatomy.—The chief forms of cancer of the liver are the nodular and massive.

The nodules in the nodulary form vary in size from one-fifth of an inch to two inches in diameter and are found throughout the entire organ. They are opaque, of a yellowish white color, and the superficial ones may occasionally be felt through the abdominal walls.

In the massive forms the lesion is one large cancerous mass, sometimes as much as six inches in diameter, and of a grayish white color. This form is primary.

The primary form of cancer starts in the liver cells and thus a stroma of independent growth is added. The secondary form results from emboli usually through the portal vein but occasionally through the hepatic artery, and thus the liver cells become affected. In time the hepatic cells undergo atrophy caused by the pressure of the new growth. The portal circulation becomes blocked owing to compression and atrophy of the branches of the portal vein while the branches of the hepatic artery are enlarged and permeate the new growth.

Symptoms.—The enlargement of the liver, increased nodules may be present upon examination. Other symphepatic dullness, pains on palpation and recognizable toms are loss of appetite, nausea, dyspepsia, flatulency, constipation, epigastric fullness and tenderness over the hepatic region. Fever rarely occurs. There is jaundice, ascites, a cold dry skin with emaciation and characteristic cachexia.

Diagnosis.—The age, emaciation, cachexia, enlargement of the liver with nodules, pain, tenderness and a rapid course are the points of differentation.

Prognosis.—Terminates in death after a course of a few months to a few years.

Treatment.—Indications of the treatment are to relieve the suffering of the patient and to prolong life. I am satisfied that if a carefuly study of the case is made and thorough peristent treatment is given the life of the patient can be considerably prolonged. The suffering can be lessened by early symptomatic treatment.

CIRRHOSIS OF THE LIVER.

Synonyms.—Chronic interstitial hepatitis; granular liver; gin liver; hob-nail liver.

Definition.—A chronic disease of the liver characterized by hyperplasia of the connective tissue with destruction of the liver cells, resulting in the organ becoming hard and small.

Etiology.—The disease usually occurs in the male sex and in middle life. When occurring in children it is usually of the syphilitic form. The abuse of spirituous liquors is a common cause. It follows chronic diseases such as syphilis, long continued malarial intoxication, gout and tuberculosis. Passive congestion due to chronic heart and lung disease cause some cases. A few cases are caused by inflammation of the bile ducts due to obstructing calculi; others to a stimulating diet, while some cases are inexplicable. The disease has been thought to be brought to the liver by the blood of the portal vein and in that way it is carried to the connective tissue of the capsule, which follows closely the branches of the vessel.

Morbid Anatomy.—The first stage is hyperplasia of the connective tissue and consequent enlargement of the organ. As this increases the connective tissue destroys immense numbers of the hepatic cells owing to the pressure. Often the enlargement is accompanied by tenderness.

In the latter stage the overgrowth of imperfectly developed connective tissue seems to contract the hepatic cells that still remain, causing atrophy and death of most of them, and thus reducing the size of the organ, which is followed by sclerosis. The portal and hepatic circulations are greatly obstructed. An occasional form is termed hypertrophic sclerosis in which sclerosis is found while the organ continues enlarged.

There are two well defined varieties, atrophic cirrhosis and hypertrophic cirrhosis—while some authors add fatty cirrhosis and peri-hepatitis or Glissonian cirrhosis.

Atrophic Cirrhosis.—The surface of the liver is rough and uneven in addition to its hardness and reduction in size. It may also be greatly deformed and covered with granulations ("hob-nails"). The normal weight is four or five pounds, but it may be so reduced as to weigh no more than one pound or a pound and one-half. Sometimes there is fatty infiltration which enlarges the liver to such an extent that the contraction is not noticed. There is an overgrowth of the connective tissue which contracts and constricts the branches of the portal vein, causes atrophy and degeneration of the hepatic cells, and even sometimes obliterates the bile ducts. The new connective tissue is well supplied with blood vessels from the hepatic artery thus aiding greatly in its growth.

Hypertrophic Cirrhosis.—In this form as well as in atrophic cirrhosis there is an overgrowth of connective tissue but in the hypertrophic form the new form of tissue exhibits no disposition to contract. The enlargement of the organ is largely due to hyperaemia. As the tissue does not contract there is no pressure on the branches of the portal vein and atrophy is prevented. There is jaundice (which is a characteristic symptom) owing to obstruction of the biliary channels. The surface is smooth and its color is greenish yellow.

Complications.—The complications may be intestinal nephritis, cardiac hypertrophy, tuberculosis or haemorrhage.

Symptoms.—*Atrophic Form.*—In the most extreme cases of this form there may be practically no symptoms. As there is obstruction of the portal circulation there may be congestion of the stomach and intestines, resulting in

chronic gastric or intestinal catarrh having the following symptoms—anorexia, distress after eating, distention, constipation and coated tongue. Owing to the anastomotic communication between the portal and caval circulation, as the portal circulation becomes more obstructed, the superficial abdominal veins become greatly distended. The caput medusae about the navel is seen in extreme cases. This is due to the connection between the rudimentary veins of the round ligament (branches of the portal vein) and the epigastric and mammary veins, which leads to the enlargement of their superficial branches on occlusion of the main vessels. Haemorrhoids are due to the communication of the superior haemorrhoidal which is a branch of the portal vein through the inferior and middle haemorrhoidals, with the hypogastric vein and the vena cava; hence haemorrhoids are a characteristic symptom. There is enlargement of the spleen and haemorrhage from the stomach or bowels. Oedema of the legs and ascites are due to engorgement of the portal system. Ascites is much more common than oedema of the legs. There may be slight jaundice, although this is a rare symptom in atrophic cirrhosis. There is always decided emaciation.

On examination there is diminished area of hepatic dullness, while the splenic dullness is enlarged. It is often quite impossible to outline these organs, as the abdominal distention prevents it. The urine is scanty, high-colored and often loaded with urates, but seldom bile-stained.

Hypertrophic Form.—Slight jaundice appears at the onset, which gradually deepens until it is intense and persistent. There are neither ascites, haemorrhages nor enlargement of the spleen, but there is enlargement of the liver with tenderness; there being apparently no hyperaemia of the stomach or bowels. The urine is often bile-stained, but of normal quantity.

Diagnosis.—In *atrophic cirrhosis*, with ascites without dropsy elsewhere, history of alcoholism, haemorrhage from stomach or bowels and reduction in size of liver, the diagnosis is absolute.

Hypertrophic Cirrhosis.—In *cancer of the liver* the patient is advanced in years, has no splenic enlargement, and more usually ascites is present; while in hypertrophic cirrhosis there is a well marked history of alcoholism, chronic biliary obstruction, the liver is only slightly enlarged, is hard, with marked jaundice, with causes leading to or evidence of hepatic obstruction. Its course is more rapid and the liver later diminishes in size. This form of cirrhosis is also distinguished from amyloid liver and multilocular hydatid disease.

Prognosis.—Unfavorable, although in some cases the disease has been arrested during the early stage. Death usually occurs from one to two years after appearance of dropsy.

Treatment.—If the disease is recognized at the beginning and persistent treatment given to the liver the chances are that atrophy of the cells and connective tissue formation will not take place. But ordinarily cases of cirrhosis are incurable. The most that can be done is to re-establish a compensatory circulation in the liver. Otherwise it would be as unreasonable to say that one could cure a chronic valvular lesion of the heart. The patient should live a quiet out-door life. Alcoholic drinking should be stopped. The diet should be light and nutritious, preferably a milk diet. The bowels should be kept open, the skin active and the kidneys closely watched.

AMYLOID LIVER.

Synonyms.—Lardaceous liver; waxy liver; albuminous liver; scrofulous liver.

Definition.—An infiltration into the tissues of the liver, of the so-called amyloid substance. The infiltration begins in the blood vessels, the hepatic artery first, then the central zone, next the portal zone or periphery, and finally all structures of the liver.

Etiology.—This condition is usually found in cases of prolonged suppuration, especially associated with tubercular diseases of bone as in hip-disease, syphilis, rickets, cancer and leukaemia. Lesions are found from the fifth to the tenth dorsal vertebrae.

Morbid Anatomy.—The liver is considerably enlarged. It is pale or waxy in appearance and is doughy in consistency. On section it is anaemic and whitish partly due to infiltration into the walls of the blood vessels, lessening the lumen. The liver is usually rounded, hard and smooth. The amyloid changes may be circumscribed and in some cases fatty infiltration is present.

Symptoms.—There are no characteristic symptoms except the enlargement of the liver. Pain is absent, although occasionally there is dragging sensation due to the weight of the organ. Jaundice is not present, but the stools may become light colored, owing to a diminished secretion of bile. The urine may be increased in amount and contain some albumin if amyloid changes occur in the kidneys. Emaciation and anaemia are present and ascites seldom occurs. Amyloid changes involve the spleen, kidneys, intestines and other organs.

Diagnosis.—Usually easy. The organ being large, hard and smooth, with absence of jaundice and ascites, the presence of albuminuria and an enlarged spleen, and with the history of the case, mistakes are not likely to be made.

Prognosis.—Depends upon the cause. The progress may be rapid or slow.

Treatment.—Careful attention to the primary disturbing factor and direct treatment to the liver will in many instances reduce the size of the organ. The vaso-motor nerves of the portal system (fifth to last dorsals) should be treated thoroughly.

ACUTE YELLOW ATROPHY OF THE LIVER.

Synonyms.—Malignant jaundice; icterus gravis; acute parenchymatous hepatitis.

Definition.—A disease characterized by marked jaundice with rapid destruction and general inflammation of the hepatic cells, the size of the liver being markedly reduced, and by great disturbance of the nervous system.

Etiology.—This disease is of rare occurrence and more frequently found in women than in men. It seems to be associated with pregnancy, usually during the second half. It seems to be of an infectious origin due to the action of some virulent poison. Cases subject to alcoholic excesses, mental excitement and syphilis are apt to suffer from the disease.

Morbid Anatomy.—This disease closely simulates phosphorus poisoning and some authors consider it a result of phosphorus poisoning. Other authors regard the disease as being caused by the retention of bile, the hepatic cells being destroyed by this retained bile. In fact, very little is known of the real cause, but on post-mortem examination the liver is found much reduced in size and on section the surface is yellow or yellowish red. The yellow condition is of the first stage while the red appears later. At first the organ is soft and spongy while later it becomes quite firm. The hepatic cells are destroyed and this suggests the action of a poisonous chemical compound. The

spleen is enlarged. There is granular degeneration of renal epithelium. Other organs, as well as the skin show marked bile staining. The heart muscle is fatty and numerous haemorrhages occur.

Symptoms.—At first the jaundice is thought to be simple, with gastro-intestinal catarrh. In fact there are no distinct symptoms of this disease at the beginning. This may last from a few days to a couple of weeks and then the symptoms become more severe. Headache, convulsions, delirium and vomiting, sometimes with blood, occur. The patient may be in "a typhoid state," with pulse rapid and tongue dry and coated. There is marked dimunition in the size of the liver. There is great change in the urine and it is very characteristic. It is bile stained and often contains bile stained fatty casts with leucin spheres and tyrosin (needle shaped crystals) and renal epithelium. When the bile enters the intestines, as is generally the case, the stools are clay-colored.

Diagnosis.—The marked dimunition in the size of the liver, the deep jaundice with delirium (although in any case of severe jaundice there may be cerebral symptoms) and the presence of leucin and tyrosin in the urine, will differentiate this disease.

Prognosis.—Is very unfavorable, the disease being almost always fatal.

Treatment.—To my knowledge osteopathy has never had any experience with acute yellow atrophy of the liver, it being of rare occurrence; and but little being known of the pathology, it is impossible to do more than outline a symptomatic treatment. Probably persistent work to the vaso-motor nerves to the liver and attention to the excretory organs would be especially indicated. The application of ice over the liver is said to be helpful.

GALL STONES.

Synonyms.—Cholelithiasis; hepatic colic; biliary calculi.

Definition.—Concretions which originate in the biliary ducts or gall bladder derived from substances which are all contained in a state of solution in normal bile with exception of epithelium and mucus, these being supplied by the mucous membrane of the biliary passages.

Etiology.—This is a disease of middle life more frequently found in women. Sedentary habits combined with overeating are important factors. Usually found in stout subjects who are particularly fond of starchy and saccharine food; tight lacing may induce gall stones by retarding the flow of bile. Also constipation and depressing mental influences are sometimes regarded as favoring circumstances.

The great bulk of a gall stone is cholesterin and probably the formation of the concretion is a precipitation of this substance from the bile. Other conditions which cooperate to form the stone are not definitely known. Possibly the actions of micro-organisms in the bile causing decomposition of the cholate salts of sodium which hold in solution cholesterin may be an important factor in the preciptation of cholesterin. Conditions inducing lithic acid favor the development of gall-stones. The thicker the bile the more likely it is to deposit. Possibly the internal secretion of the spleen acts as a solvent to cholesterin.

In all cases of gall-stones the osteopath finds lesions to the 8th, 9th and 10th ribs on the left side. The lesions at these points over the spleen interfere with the activities of the spleen and thus in some manner the spleen does not properly elaborate the blood before it passes to the liver. An interference with the function of the spleen is where the osteopath finds the real cause of gall-stones. In carcinoma of the liver and stomach gall stones are said to be frequent.

Morbid Anatomy.—Gall stones are composed chiefly of cholesterin. In addition there are small amounts of calcic carbonate, bile pigment and organic matter. The stone itself is a brownish object nearly spherical, faceted and in some instances polygonal in shape, varying in size from a pea to a hen's egg.

The stones are found anywhere in the biliary tract from the duodenal orifice to the ramification of the bile vessels. Many times there is more or less of an accumulation in the gall bladder. At any point the stone may produce ulceration and suppuration. Perforation may occur into the peritoneal cavity or adjacent organs.

Symptoms.—Gall stones may be in the gall bladder for years without giving rise to any symptoms. Their presence is made known only by their expulsion from the gall bladder. If they lodge in the duct in their transit from the gall-bladder to the duodenum biliary colic is produced, which is the characteristic symptom of an impacted gall stone. Small stones may pass into the intestine without producing symptoms. The pain is very sudden, piercing and excruciating in the region of the gall bladder when a stone attempts to pass. The pain radiates through the abdomen, right chest and shoulder, and the patient writhes in agony and occasionally faints.

There is always tenderness in the biliary region with more or less contraction of the abdominal muscles. Nausea and vomiting are usually present, followed by a weak pulse, cool skin and pale and anxious face. Fever is soon present and a chill is quite common. The paroxysms continue as long as the stone remains lodged, which may be from an hour to several days with remissions, entire relief being given as soon as as stone reaches the duodenum. Jaundice usually follows a prolonged attack. The liver is sometimes en-

larged. Should the stone become impacted ulcerative perforation with consequent peritonitis and shock follows.

Diagnosis.—The diagnosis is conclusive when the gall stones are found in the stools or when they can be felt in the gall bladder. All the above symptoms are characteristic. If a patient complains of severe pain radiating from the hepatic region, and nausea and vomiting are present, subsiding suddenly with a slight jaundice, the disease should hardly be mistaken.

Nephritic colic should never be confounded with hepatic colic as in the former the pains start in the lumbar region and radiate downward into the groin, the testicle and the inside of the thigh. In appendicitis, jaundice and bile-stained urine are not found. A pseudo-biliary colic is occasionally found in nervous women, especially when the 11th and 12th ribs on the right side are displaced downward.

Prognosis.—Is usually favorable. Only in cases when perforation occurs does a fatal ending result.

Treatment.—During an attack of biliary colic the osteopath should be able to readily locate the position of the gall stone in its transit from the gall bladder. He should proceed at once to aid the stone in its downward passage by careful manipulation over the duct.

Rarely will one have any difficulty in dislodging the stone and in completely relieving the sufferer in a very few minutes. The recumbent position with the thighs flexed on the abdomen is the position assumed for treatment, and if the muscles in the hepatic region are very tense and rigid interfering with locating the gall stones an inhibitory treatment to the posterior spinal nerves supplying the contracted muscles will aid one materially. Also an inhibitory treatment of the nerves of the biliary tract, the 9th and 10th dorsal, may be a helpful measure in dilating the duct.

During remissions two or three treatments per week should be given to correct the lesions at the 8th, 9th, 10th and 11th ribs over the spleen, especially treat the region of the tenth dorsal well. Also a thorough treatment of the liver will be helpful. Occasionally a lesion will be found in the ribs over the liver and in the dorsal splanchnics corresponding to the liver. Average cases should not require more than two or three month's treatment.

The use of hot cloths over the affected region will be of some help during the attack. Permanently impacted gall stones require surgical treatment. Prophylactic treatment as a regulated diet, daily exercise and stoppage of excesses should be strongly urged. The patient should not be allowed any fatty or saccharine food. Water freely taken will be of aid.

DISEASES OF THE SPLEEN.

SPLENITIS.

Synonyms.—Inflammation of the spleen; lienitis.

In splenitis there is generally a blocking up of the smaller splenic arteries by fibrous coagula which have formed in the left ventricle of the heart in consequence of endocarditis. Malarial infections, septicaemia, typhus and acute exanthematic fevers may cause coagula formation in the splenic veins. Injuries to the vertebrae or ribs on the left side over the spleen (ninth to eleventh ribs inclusive) are occasionally the causes of primary inflammation of the spleen. Following the formation of abscesses the entire organ may suppurate; it may produce pyaemia, or it may burst and the pus be discharged into the peritoneal sac causing peritonitis, or into the pleura, stomach or colon.

Symptoms.—Tenderness and enlargement of the spleen are the symptoms. The organ may be twice its normal size,

but in a few cases the tumefaction is so insignificant that it can hardly be found by percussion. Dull pain generally exists if the enveloping membrane or adjacent organs are involved, the pain being increased upon percussion and deep inspiration. In a few cases the pain radiates to the left shoulder and if the peritoneal covering is involved a sharp pain will be present. Fever and rigor follow if suppuration has taken place and peritonitis follows in case of rupture or perforation. Marked hypertrophy and chronic inflammation may cause cough, nausea, vomiting and dyspnoea.

Treatment.—In the treatment of both the disease producing splenitis and of primary splenitis, a thorough treatment of the spine, eighth to the eleventh dorsal is necessary.

The nerves (vaso-motor) to the spleen are from the left splanchnics, consequently treatment of the left side is more effectual. Particular attention should be given the ribs over the spleen—the 9th, 10th, and 11th—as disorders of these ribs are a common cause of splenic diseases. Careful and fairly firm treatment is always indicated over the spleen, care being taken not to add irritation to an already highly inflamed spleen and especially beware that force is not used where there is danger of rupture of the spleen. Stimulation of the 10th nerve contracts the spleen.

Stimulating treatment over the spleen, as over the liver and kidneys, gives tone to the strong elastic capsule surrounding it, so that direct manipulation over these organs, coupled with the power of the strong elastic capsule and highly elastic tissue of the inner organ will greatly aid in lessening the engorgement and hyperaemia of the organ. In a few cases where the spleen is involved lesions are found in the upper cervical which affect the right pneumogastric nerve and thus impair the normal activity of the gland.

DISEASES OF THE PERITONEUM.

ACUTE PERITONITIS.

Definition.—An acute inflammation of the peritoneum.

Etiology.—*Primary Peritonitis* may be caused by exposure to cold and wet; also by blows over the abdomen and penetrating wounds of the abdomen, by injuries to the dorsal and lumbar spines and by injuries to the lower three or four ribs on either side.

Secondary Peritonitis.—This follows inflammatory diseases of the digestive tract and genito-urinary system. The inflammation may extend to the peritoneum in gastritis, inflammation of the intestines, particularly appendicitis, in acute suppurative inflammation of the liver, spleen, pancreas and various pelvic viscera, and especially following septic endonephritis. It always follows perforation of any organ, as the intestines and gall bladder, and often arises from ulcers and cancers of the stomach and intestines. It is secondary to general morbid processes, as rheumatism, Bright's disease, tuberculosis, Pott's disease, scarlatina, typhoid fever and septicaemia. It may follow rupture of various abdominal vessels and perforating wounds of the intestines; it may even follow pleurisy on account of the communication between the pleural and peritoneal cavities by the lymphatics.

Morbid Anatomy.—The peritonitis may be acute or general, and the exudate sero-fibrinous, fibrinous or purulent. In the first stage the peritoneum is red, sticky, dull and uneven on account of the desquamation of the epithelium. In the last stages the exudate becomes sero-fibrinous, fibrinous or purulent, and adhesions often result between the coats of the intestines and adjacent organs.

In general peritonitis the peritoneum covering the intestinal coils is congested and fibrin and leucocytes which go

to make up the yellow lymph cover the surface of the peritoneum to a greater or less extent. In localized peritonitis the formation of lymph occurs and the adhesions are more pronounced. The inflammatory portion becomes encapsulated and if absorption does not occur pus may form and the abscess ruptures into the general peritoneal cavity causing general peritonitis, collapse and death.

In all cases of peritonitis the normal secretion of the peritoneum is lessened and if adhesions do not occur by an arrest of the inflammatory processes, exudation of a greater or less amount of fluid takes place within the peritoneal cavity, recovery resulting, the fluid being absorbed and causing deformity and irregularity of the abdominal organs.

Symptoms.—*Acute General Peritonitis.*—This sets in with chilly feelings or actual chill, followed by a moderate fever, intense pain and extreme tenderness in the abdomen. The chills are not necessarily the initial symptom, pain being sometimes the first noticeable sign. The abdomen is usually so painful that the patient lies upon his back with the thighs flexed and shoulders elevated so as to lessen any strain upon the abdominal parietes. The acts of breathing and emptying the bladder may cause pain. The greatest pain is usually below the umbilicus, but it may radiate to the lumbar and dorsal regions and to the shoulder and chest. Distention of the abdomen gradually takes place and becomes tense, supposed to be due to a paralysis of the muscular coat of the intestines. There is a rapid, wiry pulse. The tongue is coated white, oftentimes becomes red and fissured. The features are pinched, vomiting persistent and the bowels usually constipated. The urine gradually becomes scanty and high-colored.

Other symptoms may follow the preceding, as an anxious expression, sunken eyes, cold clammy skin, feeble

pulse and collapse. Tympany is excessive. When ascites is present the flanks are dull unpon purcussion and the dullness may be movable, depending upon the amount of adhesion. Cases may terminate in death within forty-eight hours, but usually the course is from four to eight days.

Acute Localized Peritonitis.—In this the symptoms of acute general peritonitis occur in a milder form; the fever is more constant and the disease runs a longer course. The symptoms are those of circumscribed abscess; particularly fluctuation is present. There are symptoms of the disease producing the circumscribed peritonitis.

Diagnosis.—A typical case gives little difficulty in the diagnosis; severe pain at the onset, distention of the abdomen, the tenderness, chills and fever, vomiting, effusion and collapse, are characteristic of this condition.

Acute Enteritis.—In this the pain and tenderness are not so marked nor localized. There is more frequent diarrhoea, absence of wiry pulse and the collapse is more extreme.

Intestinal Obstruction.—This may be impossible to distinguish at first. The history, the fecal vomiting, the absence of wiry pulse, of fever and of any marked tenderness, will distinguish it from peritonitis.

Hysterical Peritonitis.—Every symptom of peritonitis may be present, even the collapse; but time will tell, as these patients do not die. If the attention is distracted, the pain may vanish. It is confined to the female sex, and accompanied by hysterical symptoms.

Rheumatism of the Abdominal Muscles.—In this there is rheumatic history, and the abdominal distention and characteristic features of peritonitis are lacking. Tenderness of the abdomen is not aggravated by deep pressure; the affection is sub-acute.

Prognosis.—Not generally favorable in acute peritonitis. Mild cases may recover. Death usually results in from two to six days from exhaustion.

Localized peritonitis is more favorable especially when not septic.

Treatment.—Absolute rest of the patient, in a position that is as comfortable as possible. The abdominal splanchnics should be treated thoroughly but as carefully as possible. At times an inhibitory treatment to the spinal nerves of the dorsal and lumbar region and relaxing the spinal muscles will relieve the pain. But I believe it is of vastly more importance to give a strong, thorough, stimulating treatment to the splanchnics, correcting lesions, if any, and relaxing muscles by manipulating the spinal column and lower ribs so as to tone up and contract the dilated intestinal musculature that is producing the distention, and to lessen the peristalsis of the intestine. The best we can do is to favor the dispersing of abnormal nerve energy by correction of all disorders of the vertebrae and ribs and nature will cure when thus aided. Naturally when the case is exhausted to some degree the treatment must be made accordingly lighter. The ultimate result will be the same, as all we can attempt to do is to aid a crippled nature by correcting anatomical disorder and not by directly stimulating or inhibiting nerve force, for that can be only temporary unless external agents are used. On the whole, contractions and relaxations of soft tissues are only gross manifestations of internal disorders and are to be used as a clue to the disorder or as a symptom in making a diagnosis and not as a means of relieving suffering. Although I willingly admit that relaxation of contracted soft tissues, as for instance of the cervical region, if the contraction has been caused by sitting in a draft, will cure a few acute disorders, universal application

of and reliance on it should not be had, else one is simply on a level with a mausseur of limited anatomical training.

An inhibitory treatment of the vagi nerves will lessen peristalsis to a slight extent and particularly so if the peristalsis is abnormally increased and the principle of cure is not through mere inhibition of the vagi, but in removing the stimulus producing an increased nerve action. The bowels should not be allowed to become clogged but be kept normally active; this tends to drain the peritoneal cavity of the products of inflammation and lessens the congested condition of that region, depleting the vessels of the intestinal walls. It also aids in lessening the pain and improving the general state of the patient. Cold or hot applications, which ever are the most agreeable to the patient, can be placed over the abdomen to aid in relieving the pain. The diet should be a regulated nutritious one of peptonized milk, beef juice, egg albumin or light gruels of pearl barley or arrow root, given in very small amounts in order to avoid vomiting if possible and to be less irritating to the digestive organs. In severe cases rectal treating should be employed. Good, nourishing and dieting will accomplish much.

The nausea and vomiting can usually be lessened by a thorough treatment of the 4th, 5th and 6th dorsals and of the vagi. In cases of perforation the local use of ice is indicated, with stimulation of the system by careful attention to the vagi, sympathetic, phrenic and splanchnic nerves, and then asbolute rest. In all serious cases laparotomy should be considered, as surgical interference frequently has saved life by timely work.

CHRONIC PERITONITIS.

Etiology.—The majority of cases are due to tuberculosis. Some are caused by cancer and various growths in the abdomen. Many present old injuries of the lower ribs on

either side and of the vertebrae of the lower dorsal and lumbar regions and occasionally lesions of the pelvis. Other causes may be sclerosis of the liver, Bright's disease, scrofula, chronic alcoholism and syphilis. It rarely follows the acute form.

Chronic peritonitis may be a local circumscribed or chronic adhesive peritonitis, or diffused chronic peritonitis may occur.

Morbid Anatomy.—*Local Circumscribed or Chronic Adhesive Peritonitis.*—The adhesion occurs between the spleen and diaphragm, liver and diaphragm, or stomach and liver or between various adjacent organs. The union usually consists of fibrous strands of variable length. A coil of intestine may become snared and produce intestinal obstruction.

Diffuse Chronic Peritonitis.—The intestines become matted together by the fibrous links. The peritoneum is thickened and the omentum may become thickened and contracted; the spleen and liver are sometimes covered by thick, tough capsules. The effusion varies in amount and may be bloody in tubercular and cancerous cases.

Symptoms.—In the localized form symptoms of intestinal obstruction may be the first noticeable. In others there is colicky pain, constipation and a feeling of restriction of the organs involved whenever motion occurs. There also may be some tenderness upon manipulation over the abdomen and a hectic fever.

In the diffused chronic form there are the symptoms of acute peritonitis in a moderate degree. They consist of paroxysmal pain, diffused tenderness, tumor like swellings over the abdomen, possibly a slight fever, oedema, irregularity in the movements of the bowels, albuminuria, anaemia and emaciation. The effusions may be sacculated, the

coils of the intestines dilated, and friction fremitus and fluctuations may be observed.

Prognosis.—Is usually unfavorable for the reason that the large majority of cases are tuberculous.

Treatment.—The treatment is necessarily chiefly that of the disease producing it and one must be governed by circumstances. Rest with a nutritious diet of steak, chicken, fish, eggs and milk is indicated; starches and sugars should be avoided, from their tendency to ferment and dilate the bowels. When the effusion is great paracentesis will be necessary. Operative interference will be required in many instances where there are simple adhesions, and occasionally in the tubercular form.

The nerve supply of the peritoneum is from the vagi, splanchnics and sympathetic. By paying due attention to correction of lesions of these nerves and by direct treatment over the abdomen a number of cases can be cured.

ASCITES.

Synonyms.—Hydro-peritoneum; dropsy of the abdomen; peritoneal dropsy.

Definition.—Any collection of fluid of a serous nature in the peritoneal cavity.

Etiology.—It may form a part of general dropsy as from cardiac or nephritic disorders. The most common cause is obstruction to the portal system. Others are chiefly diseases of the liver, and lesions of the ribs and vertebrae from the fifth to the ninth dorsal on the right side involving the vaso-motor nerves to the portal circulation.

Growths or inflammatory processes in the gastro-hepatic omentum and hepatic fissure, producing pressure upon the portal vein may cause ascites. Also tumors elsewhere in the abdomen, even of the ovary, and enlarged spleen and uterus, if of sufficient pressure would have the same effect.

Chronic lung diseases, chronic peritonitis, anaemia and pressure upon the thoracic duct are important causes; or a downward displacement of the lower ribs of either side may cause a prolapsed diaphragm and interfere with the various blood vessels from the abdomen as well as the thoracic duct.

Symptoms.—Whenever there is venous engorgement of the vessels draining the peritoneum ascites is more or less of a prominent symptom. When the effusion is large there is sensation of weight, the abdomen is pendent when the patient stands, widened when lying on the back and the fluid flows from one side to the other when the patient turns over. A gradual uniform enlargement of the abdomen is quite characteristic. There is also dyspnoea, oedema of the feet, scanty urine and constipation.

Palpation.—A peculiar wave-like impulse is obtained by placing the fingers of one hand on one side of the abdomen by giving a sharp tap on the opposite side with the other hand. There is a sense of resistance in the flanks when the succussion wave is elicited.

Percussion.—When the patient takes the dorsal position a dull sound is heard on percussion at the flanks while a tympanitic sound is heard at the umbilical and epigastric regions. When the patient turns over on the side the upper flank is tympanitic and the lower dull upon percussion. If the amount of fluid is too small to detect in this manner then place the patient in the knee-elbow position when a dull sound will be determined at the most dependent portion.

Aspiration.—The fluid when withdrawn is clear, yellow and albuminous serum. Specific gravity is from 1011 to 1015. The fluid of ovarian cysts is albuminous and coagulates spontaneously. Specific gravity about 1020.

Diagnosis.—*Ovarian Tumor.*—This will be distinguished by the history of the case, enlargement being limited to iliac fossa, dullness quite immovable on change of position,

and by examination through vagina and rectum. If the examination is carefully followed up in this manner one will rarely error in the diagnosis.

Distention of the Bladder.—Differentiated by the history, tenderness over the bladder, location of the dullness and rounded outline, and by careful catheterization.

Pregnancy.—The history, nature of the enlargement, changes of the uterus, lack of menses, growth of mammae, sounds of foetal heart and absence of fluctuation, will distinguish pregnancy.

Chronic Peritonitis.—In this there is a different history, pain, tenderness and irregular enlargement of abdomen, and vomiting; the fluid is more albuminous and of a higher specific gravity.

Tympanitis.—This is characterized by a tense abdomen and a universal hyperresonance on percussion.

Treatment.—Attention to the cause is of first importance and removing the fluid of secondary consideration; unless the cardiac and respiratory action are too greatly embarrassed by a large amount of fluid; in which case removal of the fluid at once by trocar or better an aspirator is necessary. By keeping the bowels active the congested blood vessels of the abdomen are more or less depleted with a consequent lessening of ascitic fluid. Also in keeping the kidneys and skin active aid will be given the other emunctories, particularly the bowels.

In ascites the ingestion of much fluid is contra-indicated, a diet of bread and meat being the best. A few cases will yield by adhering to this diet, stimulating the heart and increasing the action of the kidneys. On the whole it is absolutely necessary to determine carefully the cause and act accordingly.

SECTION VI.

DISEASES OF THE RESPIRATORY SYSTEM.

DISEASES OF THE NOSE.

ACUTE NASAL CATARRH.

Synonyms.—Coryza; acute rhinitis; cold in the head.

Definition.—An acute catarrhal inflammation of the mucous membrane of the upper air passages. This is usually an independent affection but sometimes it precedes the development of another disease, such as measles and influenza.

Etiology.—Lesions of the upper cervical vertebrae, chiefly of the atlas and third cervical, and contractions of the deep and superficial muscles of the cervical region caused by cold are the most frequent causes; also inhalation of irritating vapors or dust may cause the disease. The disease probably depends upon a micro-organism and may occur in epidemic form and seems to spread by contagion.

Morbid Anatomy.—Hyperaemia of the mucous membrane accompanied by redness and swelling. At first there is no secretion but later irritating, colorless and watery mucus flows from the nose, making the nostrils and upper lip sore. This may or may not be followed, in a short time, by a copious muco-purulent discharge.

Symptoms.—The disease is ushered in by a feeling of indisposition, slight headache, fullness in the head, frequent sneezing, and perhaps chilliness. In severe cases there are pains in the back and limbs, slight feverishness, quick pulse and the skin is dry. The fullness is due to the swelling of the mucous membrane caused by the inflammation and the patient has to breathe through the mouth. This is soon followed by a thin, clear irritating discharge, which may become muco-purulent. The mucous membrane of the tear duct is swollen, the eyes are injected and suffused with tears and the conjunctivae are injected. The inflammation may extend to the Eustachian tube and middle ear resulting

in temporary deafness. The sense of smell and sometimes the sense of taste are lost on account of the swelling of the nasal mucosa. There may be slight soreness of the throat, the pharynx becomes red and swollen, and the act of swallowing is painful. If the larynx is involved the voice is husky and sometimes lost and in severe cases there may be bronchial irritation and cough.

Duration.—The duration in mild cases is usually about one week; severe cases may continue for a couple of weeks. If the attacks are repeated frequently, the disease may become chronic. In patients who have a scrofulous taint or a tendency to rheumatism the mucous membrane seems susceptible to frequent attacks.

Diagnosis.—This is always easy, but care must be taken to ascertain whether it is the initial catarrh of severe influenza, measles, or simple coryza or not.

Prognosis.—The prognosis is favorable; there should be early and proper treatment or the catarrh may become chronic.

Treatment.—In severe cases the patient should remain in the house and the room kept at an even temperature. Most cases are easily aborted by a few treatments providing the patient takes the proper care of himself in the meantime. The muscles of the cervical region are usually found in a contracted state, especially is this so of the muscles immediately beneath the angle of the inferior maxillary bone. Such contractures obstruct, mechanically, the internal jugular and carotid veins, thereby causing a stasis of the blood in the spheno-palatine and facial veins which drain the region of the nasal fossa, and thus a hyperaemia of the Schneiderian membrane is the result. In other cases the contracted muscles (muscular contraction being due chiefly, in the case of acute coryza, to atmospherical changes) of the deep upper cervical region, especially the

rectus capitus anticus major and adjacent muscles, may produce lesions of the fifth cranial nerve and thus involve the innervation of the nasal mucous membrane. The lesions affecting the innervation of the nasal mucous membrane may be either obstructive or irritative to fibres of the fifth nerve (chiefly vaso-motor fibres, possibly secretory and trophic; the sensory and motor fibres are also involved but these are not so important). The lesions may also affect the superior cervical ganglion of the sympathetic, in part or as a whole, by the effect of mere mechanical pressure by the contracted muscles.

The anatomical situation of the superior cervical ganglion of the sympathetic is very important from an osteopathic standpoint. The ganglion is commonly anterior to the upper three cervical vertebrae, occasionally the fourth and fifth cervical vertebrae, resting upon the sheath of the rectus capitus anticus major, while directly anterior to the ganglion is the sheath of the internal carotid and internal jugular blood vessels. From this ganglion arise the carotid and cavernous plexuses which connect with the fifth nerve and I believe fibres of the fifth nerve extend all the way to the cervical ganglion as disorders of the fifth nerve are so universally caused by lesions of the atlas. Consequently it is at once seen that the primary treatment of acute nasal catarrh is to relax thoroughly all muscles of the cervical region that are found contracted and to correct any disorder of the upper cervical vertebrae that may occur and thus equalize the blood and nerve supply to the nasal mucous membrane.

Additional treatment to the fifth nerve should be given at the several points on the face where its fibres come near the cutaneous surface and also by springing the jaw open. Place the thumbs of either hand over the bridge of the nose and the fingers of either hand about the inferior max-

illary just in front of the angles of the lower jaw and while the patient opens the mouth moderately resist the act by the fingers and thumbs. This releases and gives greater freedom to the nerve force of the fifth nerve as fibres of the fifth nerve are in close relation to the articulation of the inferior maxillary, in fact it is a frequent occurrence that severe disorder of the fifth nerve is occasioned by a slight subluxation of the bone at either articulation of the inferior maxillary.

The points upon the face of importance in treating nasal catarrh are the nasal branch upon the nose, the one at the supra-orbital foramen, the two at the inner angle of the eye representing the inferior trochlear and ethmoidal nerves, and the one at the infra-orbital foramen. Hot drinks and a regulated diet will be of additional aid in severe cases.

CHRONIC NASAL CATARRH.

Synonyms.—Chronic rhinitis; chronic coryza.

Definition.—A chronic inflammation of the mucous membrane lining the nasal passages. There is an increased secretion and impairment of the sense of smell.

Etiology.—This may be the result of repeated attacks of acute coryza, but more frequently it arises from special causes. Inhalation of irritating vapors and dust, syphilis, scrofula and tuberculosis of the nasal passages, and lowered vitality are causal factors. It is commonly due to the repeated contraction of the deep cervical muscles. This muscular contraction is due to taking cold or sitting in a draft, thus interfering with the innervation of the blood and lymphatic vessels that supply or drain the nasal region. These contractures may cause lesions of a greater or less extent of the upper cervical vertebrae. Often one set of muscles may be contracted more than their opponents, in this way producing an uneven contraction or strain upon

the vertebrae. In a few cases strains, injuries, etc., may be the cause.

Varieties.—There are two varieties recognized, hypertrophic and atrophic rhinitis.

In the *hypertrophic* the mucous membrane is thickened, red, swollen and spongy. The nasal passages are obstructed by the swelling of the mucous membrane of the septum and the enlargement of the lower turbinated bones.

The *symptoms* of this form may be local or general. There is obstruction of one or both of the nasal passages causing mouth breathing, this is especially distressing during the night and disturbs the sleep. A nasal intonation of the voice may occur and in advanced cases there may be deafness due to obstruction of the Eustachian tube. In fact, a very large proportion of all cases are caused by chronic nasal pharyngeal catarrh. There is impairment of the sense of smell and usually disturbance of the secretion in the nasal pharynx takes place; very often hypertrophy of the adenoid tissue in the vault of the pharynx occurs, also of the mucous membrane around the orifice of the Eustachian tube. There may also be watering of the eyes from catarrhal occlusion of the lachrymal canal. There is no odor in this form of nasal catarrh.

The *atrophic* or *fetid* form may be a sequence of the hypertrophic form but does not necessarily follow it. The nasal mucous membrane is thinned. There is a thick purulent discharge and the mucous membrane is covered with grayish crusts which when removed show a slightly abraded surface. True ulcers rarely occur. The cavities are enlarged, the mucous membrane is pale, dry and glazed. Adherent crusts are usually present. There is a very offensive putrid odor which gives rise to the term *ozaena.* This is probably due to the excellent conditions for the growth and development of putrefactive germs rather than to any

special organism. The sense of smell is lost. Chronic purulent inflammation may extend into the accessory simuses connected with the nose. The frontal, ethmoidal and maxillary may all become involved. The atrophic process involves all the tissues including the bone.

Prognosis.—Treatment may result in great improvement, but a perfect cure is rare. The prognosis of the hypertrophic form is generally very favorable, that is, with judicious and persistent treatment.

Treatment.—The treatment should be both constitutional and local. In the first place thorough cleanliness of the nasal pharyngeal region is demanded. The diet should be very nutritious, especially in children, where loss of strength and flesh occur. In cases associated with general diseases or constitutional disorders care of the health of the patient in every particular should be taken.

The local treatment of chronic nasal catarrh is the same as in the acute form, correcting chiefly the blood and nerve supply to the nasal mucous membrane. The treatment must be most persistent as it usually takes several months of treatment to perform a cure. It is a disease that greatly taxes the patience of both the physician and the patient from the fact that there is extreme liability of the patient catching a fresh cold immediately after treatment as then all the tissues of the cervical region are relaxed and the pores of the skin are open, besides an altered structure of any mucous membrane is slow to yield to treatment.

HAY FEVER.

Synonyms.—Hay asthma; autumnal catarrh; rose cold.

Definition.—An acute catarrhal inflammation of the upper air passages usually occurring periodically every spring and autumn, often associated with asthmatic dysp-

noea due to the action of some atmospheric irritant upon a hypersensitive mucous membrane.

Etiology.—In a large proportion of cases there is local disease of the mucous membrane of the nose, such as hypertrophy and polypoid growth. An irritation of the mucosa, nervous temperament, combined with an irritant are the three factors which prevail in the etiology of hay fever. The irritant seems to be the inhalation of the pollen of plants. Changes in temperature frequently excite attacks. Heredity is an important factor, particularly in families with a neurotic taint, and it may occur through several generations. The primary nervous lesions which predispose to the disease and cause a hypersensitive mucous membrane are found in the region from the fifth cervical to the third dorsal vertebra or corresponding ribs. The disease is more common in the United States than in Europe, and certain localities favor it. It is more common in men than in women.

Morbid Anatomy.—There is a hypersensitive condition of the mucous membrane and this condition is often associated with hypertrophic rhinitis. There is hypertrophy of the inferior and middle turbinated bones and of the soft parts. The septum is usually deflected.

Symptoms.—Redness of the conjunctiva and swelling of the eye-lids, severe cough with much severe headache and distress. Sneezing and a distressing cough are common symptoms. At times there are asthmatic attacks resembling ordinary bronchial asthma to such an extent as to be undistinguishable. There is a great depression of spirits.

Duration.—The rose cold begins in May or June and lasts until the latter part of July. The autumnal beginning the latter part of August and continuing until the first frost.

Diagnosis.—Hay fever is easily recognized. The season of the year and the periodical recurrence of the cough and asthma makes the diagnosis easy.

Prognosis.—The disease rarely if ever proves fatal. Continued attacks may be followed by asthma, chronic bronchitis or the sense of hearing or smell may be lost. The paroxysms grow more severe each year.

Treatment.—In most instances hay fever is a chronic neurosis of the innervation of the upper air passages. Probably, all things being equal in given cases of asthma and hay fever, a given stimulus applied to the innervation of the bronchial tubes causing an attack of asthma, would if the same stimulus be applied to the innervation of the upper passages, cause an attack of hay asthma. The primary lesion causing hay fever is found from the fifth cervical to the third dorsal either in the vertebrae or in the ribs. Many cases are caused by a disordered first, second or third rib, although I have seen the lesion to the innervation of the nasal pharyngeal region causing hay fever as high up as the atlas or as low down as the fourth dorsal vertebra or rib.

The treatment applied should be strong, thorough and often, to the motor, vaso-motor and sensory nerves of the affected region. It is always important to treat the fifth nerve in all cases, not only on account of the various fibres it conveys to the nasal region but it aids in relieving the hyperesthesia of the mucous membrane. A firm, thorough treatment to the palatine nerves of the palate will be of great help in many instances to relieve the hyperesthesia and itching of the affected parts; it also aids in preventing sneezing. A few cases will present distinct irritating factors in the nasal fossae as polypi, hypertrophy, etc., which perhaps in some instances had better be removed at once by a specialist.

Cases moving to a favorable climate as the Adriondack or White Mountains in the east and the Rocky Mountains in the west are greatly improved. Unfortunately this does not cure them only while they remain in the locality and besides a majority of hay fever patients are unable financially to travel. Osteopathic treatment has relieved a large majority of hay fever cases undertaken and I believe that most cases will yield under the proper treatment. It has been my experience in the treating of these cases that they yield much quicker where the climate is favorable as for instance in the Rocky Mountain resorts.

DISEASES OF THE LARYNX.

ACUTE CATARRHAL LARYNGITIS.

Definition.—An acute catarrhal inflammation of the mucous membrane of the larynx. This may be ushered in as an independent disease or it may be associated with general catarrh of the upper respiratory passages.

Etiology.—One of the principal causes is exposure to cold. Improper use of the voice, such as constant use of the organ in speaking and singing, inhalation of irritating gases or dust. Traumatism is also an exciting cause; this may be due to injuries from without or from the lodgment of foreign bodies. Contraction of the muscles about the larynx or exposure to atmospherical changes is a common cause of acute catarrhal laryngitis. Such contraction of the muscles causes an interference in the circulation of the larynx which results in congestion of the mucous membrane. Lesions may also be found in the upper and middle cervical vertebrae involving the innervation to the mucous membrane of the larynx. Occasionaly the first rib becomes luxated causing a greater or less congestion of the laryngeal mucous membrane by contracting the lower anterio-lateral muscles of the neck. This disease may be associated with

certain infectious diseases, like measles, diphtheria, influenza and whooping-cough.

Morbid Anatomy.—The mucous membrane is intensely reddened and swollen. In grave cases there is oedema of the glottis, but this is rare in acute laryngitis. The true and false vocal cords as well as the trachea and epiglottis are red and swollen. A slight mucoid exudation covers the parts.

Symptoms.—There is hoarseness and cough with a sense of tickling in the larynx; these are the most constant symptoms. The cough is dry and the voice altered. At first the voice is husky, but some attempts at speaking are attended with more or less pain and finally the voice may be entirely lost. Deglution is painful. At first the expectoration is scanty but later it becomes muco-purulent. There is rarely much fever When there is considerable oedema, dyspnoea and asphyxia are prominent features.

Prognosis.—Simple catarrhal laryngitis never terminates fatally. When there is dyspnoea or asphyxia indicating oedema of the larynx the prognosis is grave.

Duration.—The attack usually lasts from one week to ten days. In severe cases it may be two or three weeks before the larynx returns to its former condition.

Treatment.—In a few cases confinement of the patient to his room and possibly the bed will be necessary; especially should the larynx have rest from phonation and the taking of food of an irritating character should be avoided. The room should be at an even temperature from 70 to 75 degrees F. and the atmosphere saturated with moisture by the generation of steam.

The tissues in the cervical region about the cervical sympathetic and vagi nerves should be carefully adjusted. The deep posterior muscles of the cervical spine are to be relaxed and direct treatment given over and about the larynx.

Relaxing tissues and raising the larynx will be very effectual in relieving the huskiness of the voice and in controlling the congestion and inflammation of the laryngeal mucosa. Besides the treatment of the vagi nerves at the atlas and their course down the lateral and anterior portion of the neck, the superior laryngeal may be treated at the upper portion of the great cornu of the hyoid bone and the inferior laryngeal at the inner side of the cleido muscle near its sternal attachment. Adjust the tissues along the course of the external carotid and subclavian arteries, chiefly the first rib for the latter. Give careful treatment to the internal jugular and innominate veins. Correct any tissues that may impigne upon the lymphatics of the mucous and submucous coats of the larynx where they are drained into the deep cervical glands.

Prompt action of the skin, freedom of the bowels, placing the feet in a hot bath and continued local hot packs, or even an ice-bag in severe cases, will be of special value at the onset; but due attention should be given these throughout the entire course. The fever is easily aborted by the cervical treatment and proper attention to the bowels and sweat glands.

LARYNGISMUS STRIDULUS.

Synonyms.—Spasm of the glottis; "child crowing."

Definition.—A spasm of the muscles of the larynx that are supplied by the inferior or recurrent laryngeal nerves. This is not excited by an inflammatory condition but it is purely a nervous condition.

Etiology.—This disease occurs in children between the ages of six months and three years. It is most prevalent in the male sex and is commonly seen in connection with rickets and sometimes associated with tetany. These attacks may be excited by reflex irritation, such as teething

or disorders of the digestive system; and especially by irritations to the nerves of the involved muscles by vertebral derangements.

Symptoms.—There is a sudden onset and the spasm may occur on waking from sleep, but it may come on either in the night or day. The disease starts with a sudden arrest of breathing, the child struggles for breath, and there are tonic muscular spasms and the face becomes congested in a few seconds. This is followed by sudden relaxation of the spasm and the air is drawn through the glottis with a shrill crowing sound. Several spasms may occur in a day or they may be weeks apart. Death rarely occurs.

Diagnosis.—The absence of fever, cough and hoarseness and its distinctly intermittent nature will differentiate it from croup.

Prognosis.—The prognosis is almost always favorable. In very young children death from suffocation may occur, but rarely.

Treatment.—The treatment should be applied either centally or peripherally, depending altogether upon the location of the irritation. If the irritation is of central origin, that is, through the innervation from the brain and spine, a correction of the superior and inferior laryngeal nerves is necessary; if the stridor is due to peripheral irritations a correction of the end-plates (muscles) over and about the larynx is required in order that the spasms be relieved.

Thorough treatment should be applied to the upper part of the chest and diaphragm, chiefly the phrenic nerves at the third, fourth and fifth cervicals and over the eighth, ninth and tenth ribs anteriorly in order that the spasms may be prevented from extending to the intercostal muscles and the diaphragm.

Placing the patient in a hot bath will be of service in some cases when the spasms are severe. Alternating hot

and cold packs about the throat are of service. The air of the room should always be kept moist. Care should be taken that the trouble is not due to gastro-intestinal disorders or to dentition. Keep the child upon a fluid diet of milk, meat broths and egg albumin.

SPASMODIC LARYNGITIS.

Synonyms.—Spasmodic, catarrhal or false croup.

Definition.—A catarrhal inflammation of the mucous membrane of the larynx with spasm of the glottis.

Etiology.—The attacks usually occur in young children. It is probably an attack of acute catarrhal laryngitis associated with difficult breathing and croupy cough caused by the spasm of the glottis. Derangements of the innervation and blood supply to the laryngeal mucous membrane and muscles of the larynx are found in about the same locality as in acute catarrhal laryngitis.

Symptoms.—These attacks generally occur during the night, the child being suddenly awakened by severe paroxysms of suffocation and a dry hard ringing cough, associated with evidences of dysponea. In half an hour or an hour or two the coughing ceases, perspiration follows and the child falls asleep. If proper treatment is not given these attacks may occur for several successive nights, the child appearing almost or quite well during the day.

Diagnosis.—The symptoms are so characteristic that the diagnosis is easy.

Prognosis.—In all instances the prognosis is favorable.

Treatment.—The catarrhal inflammation of the mucous membrane of the larynx should be treated in the same manner as simple inflammation of the laryngeal mucosa, i. e., thorough treatment of the cervical spine and direct treatment over the larynx.

During the paroxysm if the patient cannot be relieved

very shortly by the cervical treatment he should be placed in a hot bath with a temperature from 98 to 110 degrees F. This will in the majority of cases relieve the attack. In addition a hot compress may be placed about the throat. Producing emesis by irritating the fauces with the finger is necessary in a number of cases in order that the secretions in the laryngeal region may be ejected and thus suffocation and labored breathing is relieved. Also, an overloaded stomach which is causing an irritation should be emptied at once by vomiting. The bowels should be kept well open in all cases. Occasionally the epiglottis becomes wedged in the chink of the glottis, such a condition requires an introduction of a finger into the fauces to release the disorder.

Care should be taken especially following an attack that the child is not exposed to cold or rapid changes of temperature so as to avoid repetition of the spasms.

Coughing.—Coughing, not only in spasmodic laryngitis, is a most irritating and annoying symptom, but also in various diseases where coughing is a prominent symptom. The osteopathic physician is many times called upon to relieve the cough whether it is due to slight irritation of a nerve fibre alone or a symptom of a serious chronic disease. The coughing center is located in the medulla oblongata, the afferent nerves are sensory branches of the vagus, the efferent nerve fibres are found in the nerves of expiration and in those that close the glottis. Consequently coughing may be caused by stimuli to various sensory nerves, various cutaneous areas (chiefly the upper part of the body) mucous membrane of the respiratory and digestive tracts, the mammae, liver, spleen, ovaries, uterus, kindneys, etc. Perhaps the most common cause of cough is contraction of some of the muscles of the neck irritating sensory fibres. Contraction of the omo-hyoid muscle may produce an irri-

tating cough by causing traction on the hyoid bone. In a few cases the larynx prolapsus to some extent and may be a source of irritation. Lesions of the sipnal cord between the seventh and eighth dorsals, also at various points above in the dorsal vertebrae and in the ribs, especially at the second and third rib, are very apt to produce a cough. Impactions of the sigmoid flexure is oftentimes accompanied by coughing. Enlargement of the heart may cause pressure upon the respiratory tract directly and cause a deep, dull cough. Foreign bodies in the external meatus of the ear are occasionally a source of irritation and is accompanied by coughing. Thus there are innumerable sources of stimuli that may produce coughing. In all cases it is necessary to make a careful diagnosis as to whether it is an irritation to some nerve fibre that can be corrected at once or whether it is a symptom of a disease that can only be relieved by the cure of the disease.

CHRONIC LARYNGITIS.

Etiology.—The causes of chronic laryngitis are chiefly the same as those producing the predisposition to the acute form. The most common causes are over-use of the voice, constant inhalation of irritating substances, excessive use of tobacco, the use of strong alcoholic drinks and lesions of the upper cervical vertebrae. Chronic laryngitis frequently follows repeated acute attacks.

Morbid Anatomy.—Laryngoscopic examination reveals swelling of the mucous membrane but it is not as red as in the acute condition. There is rarely ulceration, although there are sometimes superficial erosions.

Symptoms.—The voice is usually hoarse and rough; this is due to a permanent thickening of the parts which produce the voice. In severe cases the voice may be lost. There is fatigue and pain after slight use of the voice, a

sense of tickling in the larynx which produces a desire to cough, and the expectoration of viscid mucus and muco-pus.

Prognosis.—As to a complete cure the prognosis is generally unfavorable although many cases are cured.

Treatment.—The patient must learn to take care of himself properly. He should avoid heated rooms, the use of tobacco and alcohol and the throat should not be protected too much. It is a good plan to bathe the neck every morning and night with cold water. He should avoid loud speaking; the sound should be expelled by the abdominal muscles and diaphragm and not by the muscles of the throat. Examine the upper air passages carefully for any obstructions that might exist which are a source of irritation to the larynx.

Special attention should be given to the atlas, axis and third cervical and even lower down the spine as not the superior cervical sympathetic ganglion only may be involved causing a chronic irritation, but laryngeal nerves may be obstructed.

Aphonia is commonly caused by a dislocated atlas. The aphonia may also be caused by swelling of the vocal cords and tissues about them and by serous effusions of the laryngeal muscles. Difficult breathing and hoarseness are occasionally very troublesome symptoms, the former is due to an inability of the glottis to dilate on account of swelling of the mucous membrane of the diseased parts and from drying of the secretions on the diseased parts, thus increasing the obstruction (this is sometimes termed pseudo-croup but expiration is easy, the stridor is from the inspiration); the later is due to a collection of mucus on the vocal cords or the cords may become relaxed, swollen or roughened.

Another annoying symptom sometimes presented is pain

on deglutition which is due to swelling of the mucous membrane of the upper laryngeal passages and the epiglottis. All of these annoying symptoms are best treated by persistent, thorough, direct treatment of the larynx. On the whole careful continued treatment of the cervical innervation and vascular supply of the larynx as in the acute form is indicated.

TUBERCULOUS LARYNGITIS.

Synonyms.—Laryngeal phthisis; throat consumption.

Definition.—An inflammation of the laryngeal tissues of tuberculous origin.

Etiology.—In the first place there must be conditions favorable to the micro-organisms before their action is of any consequence. A depressed state of the system or improper innervation or blood supply to certain tissues would be predisposing causes. A tuberculous larynx may be affected primarily by the bacilli in inspired air, but this is of rare occurrence. The larynx is most commonly affected secondarily to pulmonary consumption by the sputum.

Morbid Anatomy.—The mucous membrane is inflamed and swollen, and shows scattered tubercules which are usually about the blood vessels. The tubercles cluster, caseate and leave shallow irregular ulcers. There is thickening of the mucosa about the ulcer and the ulcer is generally covered by a grayish exudate. The ulcers may erode the true vocal cords, often destroying them completely. The ulcers slowly involve the tissues in all directions causing perichondritis with necrosis of the cartilages; the condition may involve the mucous membrane of the pharynx, the oesophagus, the fauces and the tonsils. The epiglottis may be completely destroyed.

Symptoms.—Huskiness of the voice, followed by hoarseness and in advanced stages aphonia are prominent symp-

toms. A hacking cough is usually present and the patient complains of pain in the throat, particularly on coughing, swallowing or speaking. The loss of voice with painful talking or whispering is quite characteristic. When the ulceration of the tissues of the larynx has progressed to a later stage dysphagia, suffocation and distressing paroxysms of cough occur.

Upon laryngoscopic examination the mucosa is pale, thickened and infiltrated. The tubercular ulcers are plainly seen. They are irregular in shape and shallow; at the base they are covered with a gray exudate. The vocal cords are thickened and may be ulcerated.

Diagnosis.—Is not difficult, as pulmonary phthisis is usually associated with it. Examination of the sputum for the specific bacilli will be conclusive.

Prognosis.—The prognosis is not of the best at any time. On the whole it is unfavorable.

Treatment.—In this disease osteopathic treatment has been quite effectual. Cases of primary origin are more successfully treated than when of secondary cause, but I have been surprised many times at the results gained when the disorder was not primary. The treatment must necessarily be both constitutional and local. Care of the general health as to hygiene and diet is absolutely necessary. The food must be nutritious and non-irritating. Scraped beef, raw oysters, raw eggs, soups and gruel are required. In cases where difficulty of deglutition occurs it may be largely overcome if the patient hangs his head over the side of the bed and sucks through a tube liquid nourishment placed in a dish upon the floor.

The local treatment required is thorough persistent work over the larynx and adjacent tissues. This treatment is given to increase the blood supply to the diseased tissues so that the involved parts may become absorbed or thrown off

and that the bacteria will be deprived of the circumstances favorable to their activity. Treatment along the cervical spine and upper dorsal will aid in correcting the vaso-motor disorders that exist. Local aplication of hot water will assist in relieving the pain. When pulmonary phthisis exists attention and correction of it is important; in fact, is of primary consideration to the laryngeal affection.

SYPHILITIC LARYNGITIS.

Etiology.—This disease is of frequent occurrence. It results from the virus of syphilis of the inherited disease or the secondary or tertiary stages of the acquired form.

Symptoms.—There is hoarseness of the voice, a hacking cough, difficulty in swallowing and the various symptoms of catarrhal laryngitis. The secondary form may present superficial whitish ulcers on the cords or ventricular bands, while in a tertiary stage the lesions are extensive and serious. Deep ulcers with raised edges are present, gummata develops on the submucous coat of the epiglottis and there may be necrosis and exfoliation of the cartillages. Deformity is produced by the cicatrices following the healing of the ulcers and sclerosis of the gummata. Oedema of the larynx may suddenly prove fatal.

Diagnosis.—The history of the case, the presence of other symptoms of the disease, the deep symmetrical ulcers, the absence of tuberculosis elsewhere and the absence of marked pain will usually make a diagnosis easy.

Prognosis.—Is somewhat favorable, more so at least than the tubercular form of laryngitis. There is great danger of deformity and permanent impairment of the voice.

Treatment.—The treatment should be both constitutional and local. Active measures must be taken to rid the system of the virus of syphilis, and thorough direct treatment should be applied to the larynx and to its innervation. If

the cicatrical stenosis has progressed so far that there is little hope from manipulative treatment, tracheotomy or gradual dilatation should be performed. The ulcerated portion is always to be kept clean.

OEDEMATOUS LARYNGITIS.

Synonyms.—Oedema of the glottis; oedema of the larynx.

Definition.—An acute inflammation of the mucous membrane of the larynx and that about the glottis with infiltration of serous fluid into the submucous tissue of the larynx.

Etiology.—This is a very serious affection. It may occur in connection with acute laryngitis, though rarely, and occasionally with chronic diseases of the larynx as tuberculosis and syphilis. It may be a complication of some acute infectious disease like diphtheria, scarlet fever, or erysipelas of the face. It sometimes occurs suddenly in the course of Bright's disease. Lesions as in acute laryngitis are present.

Morbid Anatomy.—The laryngoscope shows enormous swelling of the epiglottis. This swelling can be felt with the fingers very easily. The mucous membrane is tense and changed in color. There is infiltration of a serous or seropurulent fluid into the loose connective tissue of the larynx. The ary-epiglotic folds are greatly involved, and they may be swollen to such a degree that they almost meet.

Symptoms.—Extreme dyspnoea and stridulous respiration Hoarseness of the voice and later aphonia. There is a feeling of intense oppression or suffocation. Evidences of dyspnoea, anxious face, blue lips, protruding eyes and retraction of the base of the chest occurs. The sterno-cleido-mastoid muscle is very prominent.

Diagnosis.—This is not difficult. The history of the case, laryngoscopic examination and the swollen epiglottis can be easily felt with the fingers.

Prognosis.—Generally unfavorable. At any time it is extremely grave but with prompt and vigorous treatment recovery is possible.

The duration varies from a few hours to several days.

Treatment.—One must attend strictly and carefully to the laryngeal innervation as in acute catarrhal laryngitis. Obstruction to the superior or inferior thyroid, facial, internal jugular or innominata will cause tumefaction and oedema of the larynx and adjacent tissues. Also, enlargement of the lymphatics about the larynx and salivary glands may produce oedema of the laryngeal region; consequently particular care should be taken of the various tissues about these vessels and of the innervation from the cervical spines so that the veins are not obstructed or that the exudation of the blood from the vessels to the tissues is not impeded in its course and the lymphatic channels are not disordered.

The most prominent symptom is laryngeal dyspnoea and this depends altogether upon the swelling of the soft parts. If the swelling is great and the disorder cannot be removed suffocation will follow. In such cases besides giving direct treatment over the larynx introducing a finger into the mouth and reaching clear back under the roof of the soft palate and with a firm downward outward and sweeping movement on either side relax the soft tissues. The persistent use of small pellets of ice held far back in the mouth will be found very beneficial.

If one is not able to control the rapid infiltration of the larynx and glottis when such cases arise trachetomy should be performed at once. When oedematous laryngitis is due to diseases of the heart, lungs and kidneys treatment of the primary disease should be given in addition to the local treatment.

DISEASES OF THE BRONCHI.

ACUTE BRONCHITIS.

Synonyms.—Bronchial catarrh; acute bronchial catarrh; acute trachial bronchitis.

Definition.—A catarrhal inflammation of part or whole of the mucous membrane of the larynx, trachea and bronchial tubes or it may extend into the capillary tubes. This is bi-lateral affecting more or less the bronchial tree in both lungs.

Etiology.—The most common cause of acute bronchitis is catching cold. It is more prevalent in the winter and it often succeeds an ordinary cold in the head, coryza or laryngitis, the inflammation extending downward from the upper air passages. A case of acute bronchitis always presents a contracted condition of the muscles on either side of the spine in the upper dorsal region. The contracted muscles may extend as far down as the middle dorsal or as high as the entire cervical. Occasionally the ribs posteriorly are drawn downward by the extreme contraction of the muscles and the upper anterior part of the chest may be somewhat constricted and limited in its movements by the tense muscles. In a few cases the ribs and upper dorsal vertebrae are actually sub-dislocated by the extreme contraction of the muscles. The principal points affected are the second, third, fourth and fifth dorsal regions. The osteopathic control of the bronchial vaso-motor nerves is in this region. The disease is also associated with measles and it is usually a symptom of influenza. One attack predisposes to another. It affects either sex and especially children and the old in which it most frequently involves the smaller bronchi. In adult life it involves the larger bronchi. The affection is probably of microbic origin.

Morbid Anatomy.—The mucous membrane of the portions of the trachea and bronchi that are implicated become reddened, congested and more or less covered with a tough mucus mingled with epithelial cells. The hyperaemia being greatest about the mucous glands. Some of the smaller bronchial tubes are dilated. There is desquamation of the ciliated epithelium, swelling and oedema of the submucosa and infiltration of the tissues with leucocytes in severe cases.

Symptoms.—The onset of acute bronchitis is accompanied by the symptoms of a common "cold." At the beginning the cough is hard and dry without expectoration; but later it is looser, the secretion becomes muco-purulent and abundant and finally purulent. The scanty sputum at first is glairy and mucoid while later it becomes more abundant, and muco-purulent and contains pus-cells and desquamated epithelium. When the bronchial inflammation becomes fully established there is a feeling of tightness and rawness beneath the sternum and a sensation of oppression in the chest, due to swelling of the mucous membrane and the presence of secretion which causes stenosis of the bronchial lumina. There is a slight fever rarely exceeding 101 degrees F. The disease lasts from four or five days to three weeks. There is either a complete recovery or chronic bronchitis is developed.

Physical Signs.—There may be no physical signs in slight attacks of acute bronchitis of the larger tubes. In severer cases the physical signs are well marked.

Inspection may recognize increased frequency of breathing and when the smaller tubes are involved there is dyspnoea.

Palpation.—The bronchial fremitus may often be felt providing there is sufficient narrowing of the breathing tubes.

Percussion.—Sounds are normal as long as the bronchitis is uncomplicated.

Auscultation.—In the early stage piping, sibilant râles may be heard on both sides. These râles are inconstant and appear and disappear with coughing. There may be harshness of breathing added to these. When resolution sets in the râles change and become mucous and bubbling in quality. Vocal resonance in bronchitis is normal, unless complications occur.

Diagnosis.—This is generally easy. The absence of dullness and blowing breathing and the bronchial character of the cough and expectoration are usually sufficient to distinguish it from pneumonia and pleurisy. If the physical signs are noticed carefully the diagnosis is rendered easy and positive in all cases.

Prognosis.—In the very young and the very old the prognosis is unfavorable, but in a previously healthy adult the most that can happen to a case of acute bronchitis is to become chronic. But recovery is the rule and even in the aged and feeble death is rare.

Treatment.—Complete rest in a warm bed and a hot foot-bath would cure a large majority of cases in a day or two if the patient would only submit to such treatment. Most of them wish to be around on their feet and out doors and very likely attending to their business so that a cure in some cases is hard to perform. They are very liable to take cold and in a few cases it will be a great effort to prevent the bronchitis from becoming chronic.

The hyperaemic condition of the bronchial tubes is due to a vaso-motor disturbance caused generally by severe contraction of the muscles of the back in the region of the first to fourth dorsals; although the vaso-motor nerves to the mucous membrane of the bronchial tubes may be affected anywhere from the first to the seventh dorsals inclusive. Contraction of the muscles over the anterior part of the chest corresponding to the same region and caused by the

same influences, chiefly atmospherical changes, are of quite common occurrence. In the majority of cases the contraction of the chest and back muscles are so severe that the ribs are partly displaced by the tension and thus is added a complication to the disorder and from this complication chronic bronchitis is liable to occur. The rib or ribs or even vertebrae to the corresponding region oftentimes remain partly dislocated and are a source of continued irritation to the innervation of the bronchial tubes. So it is always necessary in treating any form of bronchitis to see that the ribs and verterbrae from the first dorsal to the seventh dorsal inclusive are anatomically correct.

As has been stated the disordered muscles or ribs may be affected anteriorly as well as posteriorly, consequently, the treatment applied is a thorough relaxation of the chest and back muscles and the correction of ribs and vertebrae in order that the vaso-motor disturbance of the bronchial mucosa may be corrected and the inflammation relieved. In addition to the dorsal spinal nerves and the sympathetic, the vagi are to be considered in the treatment of bronchitis, as all of these nerves, sympathetic, spinal and vagi, go to make up the anterior and posterior pulmonary plexuses from which the bronchial mucosa receives its innervation. Of the veins particularly involved in passive hyperaemia of the bronchial tubes are the superior intercostal and azygos major; thus raise and spread the ribs to give greater freedom to these blood vessels.

The excretory organs and the diet of the patient should be attended to. Especially in children the diet had best be a fluid one, as milk, egg albumin, meat broths and meat juice.

CHRONIC BRONCHITIS.

Synonyms.—Chronic bronchial catarrh; winter cough.

Definition.—A chronic inflammation of the mucous membrane of the large and middle sized bronchial tubes.

Etiology.—Chronic bronchitis may be either primary or secondary. The primary form is the result of exposure to wet and cold or to the daily inhalation of irritating vapors or dust. This form is rare, the affection being almost always a secondary one and is most commonly met with in chronic lung affections, heart disease, gout or renal disease. Or it may be caused by any disease which favors congestion of the air tubes by their obstruction of the circulation, especially mitral disease and Bright's disease. It is also caused by chronic alcoholism and as the result of repeated attacks of the acute form. Chronic vertebral and rib lesions are found from the first to the seventh dorsals inclusive.

Morbid Anatomy.—The lesions of chronic bronchitis present great varieties both as to their nature and extent. In some cases the mucous membrane is very thin, so that the longitudinal elastic fibres stand out prominently. The epithelial layer is in great part missing. The muscular coat and mucous glands are atrophied.

In other cases the mucous membrane of the bronchi is thickened, granular and infiltrated. Ulceration is occasionally noted particularly of the mucous follicles. In long standing bronchitis there is dilatation of the tubes (bronchiectasis) and emphysema may be a constant accompaniment.

Symptoms.—Pain is rarely present, there is merely a feeling of constriction beneath the sternum. The cough varies with the weather and season and there is often an absence of the cough during the summer. It is apt to be worse at night than in the morning and is frequently paroxysmal. There is rarely any fever. As a rule there is free expectoration of muco-purulent or distinctly purulent matter. Sometimes it is abundant of sero-mucous in character and again there are cases of dry cough in which there is almost no ex-

pectoration. Unless associated with other diseases the general health suffers but little, if at all. The appetite as a rule is good and the body weight is well maintained.

Physical Signs—Inspection.—The chest is usually distended and the movements limited. The condition often being the same as found in emphysema.

Percussion.—Yields a clear and hyper-resonant note.

Auscultation.—The expiration is prolonged and wheezy. This is associated with sonorous and sibilant râles and moist râles of all sizes.

Special Varieties.—Bronchorrhoea, dry catarrh, putrid bronchitis or fetid bronchitis.

Bronchorrhoea.—In this form there may be an excessive bronchial secretion. This may be very liquid and watery (bronchorrhoea serosa) but more frequently it is purulent though thin and containing greenish or greenish yellow masses; or again it may be thick and uniform. Dilatation of the tubes and ultimately fetid bronchitis may be developed.

Fetid Bronchitis.—Fetid expectoration is met with in gangrene of the lungs, abscesses, bronchiectasis, decomposition of matter within phthisical cavities or empyema with perforation of the lungs; or it may occur independently. The sputa are abundant, thin and grayish-white in color and on standing separates into three layers; the uppermost composed of frothy mucus, a middle layer of dirty green mucoserous fluid and the lower of thick greasy purulent matter in which may sometimes be found small yellow masses, the so-called Dittrich's plugs. This condition may lead to abscess, gangrene, ulceration of the bronchial tubes, with dilatation, pneumonia and rarely metastatic brain abscess. When putrefactive changes take place during the course of chronic bronchitis as a rule the following symptoms immediately appear—fever, which may be septic, increase of

cough, pain in the side and sometimes a chill. There is increased prostration. The symptoms may again abate and the usual course of bronchitis be resumed.

Dry Catarrh.—The cough is of great intensity and paroxysmal in character with little or no expectoration. It is usually associated with emphysema and is a very troublesome form. It occurs in all persons as a rule.

Diagnosis.—This is not usually difficult. *Phthisis*—The absence of fever, of haemorrhage, of tubercle bacillus and the signs of localized consolidation (usually at one or other apex) will serve to distinguish between the two.

Prognosis.—Recovery is not always accomplished. The disease being generally a secondary affection, the prognosis must depend upon the primary condition. The danger from development of emphysema, bronchiectasis and dilatation of the right ventricle must be thought of.

Treatment.—In the first place there must be a careful regulation of the hygiene of the patient; the diet may be a generous one but not stimulating. Care should be taken that the food is easily digested. A liberal diet can easily be selected from the various meats, vegetables, cereals, fruits, soups, broths, eggs and milk. Avoid wines and liquors. The clothing should be carefully selected. Flannel should be worn next the skin the year around, but care being taken that the sufferer is not too warmly clad. Due attention should be given to bathing, exercising, etc. The patient should be out in the open air considerable, but be careful that the air is not too stormy. The air of his room ought to be kept at quite an even temperature and not subject to abrupt changes.

Lesions will be found to the ribs and vertebrae from the first to the seventh dorsals inclusive. Many cases present lesions in the vertebrae from the second to fourth vertebrae, usually of a lateral nature. Other lesions of frequent oc-

currence are dislocated ribs corresponding usually to the same region in which the vertebrae are commonly involved. Correcting these disorders relieves the chronic inflammation of the tubes. Also in those cases where dilatation of the bronchial tubes occur the obstruction to the motor fibres are to be removed by the correction of the vertebrae and by removing obstruction to fibres of the pneumogastric, the fibres of which supply the transverse muscles of the bronchial tubes.

It generally takes quite a course of treatment for the cure of chronic bronchitis and one of the hardest things to contend with in the treatment is the likelihood of the patient catching cold. When a fresh cold gets thoroughly started it is almost impossible to prevent the disease from extending down the bronchial tubes as the innervation is less richer in the smaller tubes.

Those cases that are due to cardiac or nephritic diseases require the treatment of the primary disease in addition to a light bronchial treatment.

A lesion between the gladiolus and manubrium of the sternum may be found; but it is of rare occurrence in cases of chronic bronchitis. The upper portion of the sternum may be locked underneath the middle portion of the sternum; or at the point of articulation of the two portions a distinct ridge may be found caused by the articular ends being pushed anteriorly. Probably such lesions affect the innervation directly to the bronchial tubes and lung tissues.

FIBRINOUS BRONCHITIS.

Synonyms.—Plastic bronchitis; croupous bronchitis.

Definition.—A rare acute or chronic inflammatory disease of the bronchi in which a fibrinous mould of the bronchus and its branches is formed. These are expelled in paroxysms of cough and dyspnoea. These casts block the bron-

chial tubes. When these moulds are large or medium sized they are generally hollow, while those of the smaller bronchi are solid.

Etiology.—The causes are unknown. Male sex, early manhood between the twentieth and fortieth years; but the disease may occur at any period of life. Lesions occur as in other forms of bronchitis. The attack occurs most frequently in the spring months. In some cases there seems to be some hereditary influence. Chronic pulmonary diseases, like phthisis, emphysema and pleurisy are occasionally predisposing causes. It is sometimes associated with skin diseases, such as herpes, impetigo and pemphigus.

Morbid Anatomy.—The pathology of the disease is obscure. The masses that are expelled are usually round and mixed with blood and mucus. The casts are more dense but the membrane is identical with that of croupous exudates. This affection, however, is limited to certain bronchial tubes and recurs at stated or irregular intervals, sometimes for a period of several years. There is loss of epithelium in the affected bronchi and the submucous tissue is often swollen and infiltrated with serum.

Symptoms.—Acute cases are rare. The attacks may set in with rigors, high fever, pain in the side, soreness, severe paroxysm of cough and sometimes a slight haemoptysis. The symptoms are those of an ordinary acute bronchitis, but of severer character; aggravated cough and dyspnoea and fatal termination is not uncommon. Death occasionally results from suffocation. There may be but one attack without any recurrence, but in the chronic form the paroxysms recur at irregular intervals but are less severe than in the acute form.

The disease may last for ten or even twenty years; the attacks recurring weekly or a period of a year or more may intervene. The onset is marked by bronchial symptoms with

or without fever. The cough soon becomes distressing and paroxysmal in character. The sputum may be blood-stained and occasionally there is profuse haemorrhage. The expectoration is in the form of rounded ball-like masses which when unraveled are found to be moulds of the bronchi. They may be hollow and laminated or quite solid. When examined under the miscroscope they are seen to consist of a fibrillated membrane in which are imbedded leucocytes, mucus, corpuscles, fat drops and epithelial cells. Leyden's crystals are sometimes seen and occasionally Curschmann's spirals are found.

Physical signs are usually those of bronchitis. The weakened or suppressed breath sounds in the affected territory may occasionally be determined. There is sometimes a diminished expansion or even retraction of the chest wall over the affected area. There is no dullness on percussion, unless the portions of the lung supplied by the affected tubes collapse. After dislodgement of the casts the normal respiratory murmur returns.

Diagnosis.—The fibrinous casts alone are sufficient for a positive diagnosis.

Prognosis.—Generally favorable. In uncomplicated cases there is rarely any danger even though there may be severe paroxysms of cough and dyspnoea. In fatal cases the lesions of associated or preceding affections have been found, such as chronic pleurisy, pneumonia and phthisis.

Treatment.—The treatment is largely that of acute bronchitis. The disorder is slightly more extensive than in acute bronchitis, consequently in a few cases severe subluxations and luxations of the ribs and vertebrae of the upper and middle dorsals occur; besides extensive muscular contractions of the chest and neck. The fibrinous casts are somewhat of the same nature of membranous exudates elsewhere, therefore the aim of the treatment should be directed to a correc-

tion of the hyperaemia of the mucous membrane of the bronchial tubes and thus loosening and disorganizing the exudate. The vagi nerves supply a portion of the innervation to the bronchial tubes and lungs. Any disorder to them should be corrected when diseases of the bronchial tubes and lungs exist. The vagi nerves contain motor fibres to these organs; and in their innervation to the bronchial tubes they supply principally the transverse fibres. In bronchitis of various forms great effect can be secured by close attention and treatment to the inferior laryngeal nerve. This is best treated at the inner side of the lower portion of the sterno-cleido muscle.

BRONCHIECTASIS.

Definition.—Dilatation of part or the whole of the bronchial tubes.

Etiology.—As a rule this affection is a secondary one, the most common cause being chronic bronchitis. The inflammation weakens the bronchial walls so that they are unable to resist the strain that is put upon them during violent paroxysms of coughing. After dilatation has once commenced the weight of the secretion which accumulates tends to further distend the weakened walls and the elasticity of the walls, becoming impaired, is finally lost. Dilatation of the bronchi is also associated with emphysema, compression of a bronchus, aneurism or mediastinal tumor, broncho-pneumonia, measles and whooping cough in children and also traction associated with fibroid induration. Hence we find that bronchial dilatation is especially associated with bronchitis, interstitial pneumonia and sometimes chronic pleurisy. It is rarely a congenital effect in such cases. It is commonly unilateral. The lesions presented to the osteopath are largely like those found in chronic bronchitis, *i. e.* derangement of the upper four or five dorsal vertebrae and

ribs. These lesions obstruct the nerve force to the bronchial tubes and thus cause the dilatation.

Morbid Anatomy.—Two forms are recognized—the cylindrical and the saccular. Both forms may occur in the same lung. The condition may be general or partial. When general it is always unilateral.

In universal bronchiectasis the entire bronchial tree is converted into a series of sacs opening into each other. These have smooth shining walls except in the most dependent parts which are sometimes ulcerated. In extreme conditions the dilatations may form large cysts, immediately beneath the pleura. As a rule the lung tissue lying between the sacculi then becomes cirrhotic.

The partial dilatation is much more common than the universal. The bronchial mucous membrane is involved with an occasional narrowing of the lumen. Here the narrowings are most commonly cylindrical, sometimes saccular but rarely fusiform.

Histology.—In all forms there is decided change in the bronchial wall. In the large dilatations the cylindrical epithelium is replaced by pavement epithelium. The elastic and muscular layers are thin and atrophied and the fibres are generally separated. These dilatations frequently contain fetid secretions and where these secretions are retained the lining membrane becomes ulcerated.

Symptoms.—There is always cough, which occurs in severe paroxysms. The sputum is muco-purulent and is greenish brown in color, is fluid and has a sour or more frequently a fetid odor. On standing, it separates into three layers; the upper is frothy and thin, the middle mucoid and the lower is a thick sediment of cells and granular debris. Microscopically the sediment consists of pus corpuscles, fatty acid crystals which are arranged into the form of bundles, and sometimes red blood discs and haematoidin

crystals. Elastic fibres may be found if ulcers are present.

Physical Signs.—When distinctly present they are those of a cavity in the lungs. When chronic pleurisy and interstitial pneumonia are associated there may be retraction of the chest wall on inspection. The percussion resonance is impaired. On auscultation bronchial or even amphoric breathing is heard with occasionally metallic rales.

Diagnosis.—In a large number of cases this is impossible. History, paroxysmal cough, characteristic copious sputum and an absence of tubercle bacillus with little impairment of the general health will serve to distinguish bronchiectasis from pulmonary tuberculosis.

Circumscribed empyema which has ruptured into the lung may simulate bronchiectasis. This is of a much more sudden onset, with a history of previous pleurisy, the health is gradually impaired, and there is thoracic oppression and dyspnoea on the slightest exertion.

Prognosis.—Is generally favorable although many times it requires an extended course of treatment in order to perform a cure.

Treatment.—Largely the same as in chronic bronchitis. Severe lesions are found in the dorsal vertebrae about the region of the third, fourth and fifth and many times lesions of the pneumogastric at the upper cervical vertebrae are also found. The lesions are much of the same nature as those of bronchitis, but as a rule there is a much deeper or more extensive lesion. These lesions may weaken the motor innervation of the muscular coats of the bronchial tubes or in some instances possibly the extensive lesions involve the vaso-motor nerves controling the vascular supply to the bronchial tubes. In a few cases marked lesions of the ribs on either side will be found; usually the same region corresponding to the affected vertebrae.

Care should be taken as to hygienic surroundings of the patient. The diet should be carefully regulated and nutritious, as in chronic bronchitis.

BRONCHIAL ASTHMA.

Definition.—Bronchial or spasmodic asthma is a chronic affection characterized by a paroxysmal dyspnoea due to a spasmodic contraction of the muscles of the bronchial tubes or to swelling of their mucous membrane.

Etiology.—Osteopathy has had marked success in the treatment of asthma. The question naturally arises why have we had success with this disease when it is considered incurable with the majority of cases in medical practice. It is undoubtedly due to our exact knowledge of the cause of this disease as it is with many other diseases that we treat successfully.

The majority of lesions causing bronchial asthma are from the second to the seventh dorsal region inclusive, either in the ribs posteriorly or anteriorly, or in the vertebrae. These lesions involve vaso-motor nerves to the bronchioles which produces the narrowing of the tubes and thus causes the asthma. Usually the lesion is at the third, fourth or fifth ribs on the right side, although as stated a lesion may be found above or below this point at the anterior or posterior ends of the ribs or in the vertebrae corresponding to the same region. Probably lesions are found more on the right side because most people are right handed, the muscles being better developed would tend when contracted to draw the ribs from their articulation. The third, fourth and fifth ribs are usually found involved because it is the region of greatest vaso-motor innervation to the bronchial tubes.

Occasionally a lesion is found involving the pneumogastric at the atlas and axis. Such a lesion irritates fibres of the pneumogastric to the muscles of the bronchioles and

thus produces narrowing of the tubes and consequently the paroxysms.

Attacks may be induced reflexly by various excitants as dust, diseases of the upper respiratory tract, etc., but the lesions to the vaso motor and motor nerves are the real causes.

Morbid Anatomy.—True asthma is a pure neurosis. There is more or less chronic inflammation of the bronchial tubes shown by injection and thickening of the bronchial mucosa in the majority of cases. There may be found, the morbid states peculiar to chronic bronchitis and emphysema.

Symptoms.—The attack may come on at any time but usually it comes on in the night during sleep. The onset may be sudden or the attack may be preceded by premonotory sensations such as tightness in the chest, flatulence, sneezing, chilliness and a copious discharge of pale urine. Nervous symptoms, headache, vertigo, neuralgia, and an anxious, nervous, restless feeling may precede the attack. There is a sense of oppression and anxiety followed by dyspnoea. Soon the respiratory efforts become violent, the patient is obliged to sit up or runs to the window for air. His shoulders are raised, the hands are placed upon something firm so as to keep his shoulders fixed so that he can bring the accessory muscles of respiration into play. The contracted tubes resist the entrance of air. Expiration is prolonged and wheezy. In severe cases the face becomes pale, the skin is covered with perspiration, the extremities become cold, the lips, finger tips and eyelids are livid owing to defective oxygenation of the blood. The pulse is small and quick and the temperature is normal or subnormal. The attack may terminate suddenly, sometimes with a spell of coughing; this is especially so of severe cases, as the cough is generally absent in brief paroxysms. The cough is at first very tight and dry and accompanied by a tough

scanty expectoration which is expelled with great difficulty. The sputum contains rounded masses of matter the so-called "perles" of Laennec. Microscopically they are found to be of a spiral structure containing cells derived from the bronchial mucous membrane and fatty degenerated pus cells. A second form is contained in the inside of the coiled spiral of mucin, a filament of great clearness and translucency, that is most probably composed of transformed mucin. Curschmann's spirals are found in the early stages of the attack and for a time these were supposed by their irritation to excite the paroxysms. Their spiral form is unexplained. Curschmann believes that these spirals are formed in the finer bronchioles and to be a product of bronchiolitis.

Physical Signs.—Inspection.—Shows enlargement of the chest which is fixed and barrel shaped. The breathing is labored and the chest moves but slightly. The diaphragm is lowered.

Percussion.—Yields hyperresonance, especially in cases which have had repeated attacks or when the asthma is associated with emphysema.

Auscultation.—With inspiration and expiration are heard sonorous sibilant râles which are more marked on expiration. As the secretion increases which is later in the attack the râles become moist.

Duration.—The attack lasts for a variable period rarely less than an hour. In severe attacks the paroxysms recur for three or four nights or more with spontaneous remissions during the day. In some cases the relief seems to be absolute but in the majority of cases there is more or less oppression and cough for a day or two, sometimes for many days.

Diagnosis.—The physical signs, examination of the sputum and the history of the case makes the diagnosis easy.

Prognosis.—It is not a fatal disease and is only dangerous when complications arise. In long standing cases emphysema invariably develops.

Treatment.—Asthma unless complicated with bronchial and lung diseases is readily relieved during the paroxysms. Cases of many years' standing have been cured with just a few treatments. The prognosis is always favorable when the disease is uncomplicated.

To relieve an attack the physician should locate the lesion if possible and correct it; if the muscles are so severely contracted that it is impossible to make out the nature of the lesion, then strong inhibition with an upward, outward movement over the angles of the ribs involved will be quite sufficient. The object to be gained in every case is simply to relieve pressure or irritation of the dislocated tissues from the vaso-motor or motor nerves so that the narrowing of the tubes may be relieved. Strong inhibition alone will have temporary effect but it is always best to reduce the lesion if possible. In complicated cases dilatation of the rectum may relieve the paroxysm.

During the interval between the attacks is the time to remedy the disease, then one is able to locate exactly the position of the disturbed tissues that are causing the paroxysms and apply treatment accordingly in the regions given under etiology. The majority of cases of asthma are cured in from one to two months' treatment, rarely is it necessary to treat a case longer than three months. One treatment a week is sufficient providing one is able each time to accomplish something toward a correction of the lesion and that the patient does not suffer during the meantime.

Care should always be taken with the diet and as to hygienic surroundings. Gastric digestion should be complete before retiring or it may induce an attack. Complications are treated according to the disease. Examine the upper res-

piratory tract, the digestive tract and the pelvic organs when there is reason to believe the paroxysm may be induced reflexly.

DISEASES OF THE LUNGS.

EMPHYSEMA.

Definition.—Used in a general way, emphysema is a term which implies the presence of air in the interstitial tissue, but when applied to the lungs there are two applications of the term, having widely different significations, viz.: Interlobular or interstitial emphysema and vesicular emphysema.

INTERLOBULAR EMPHYSEMA.

This is produced by the rupture of air vesicles, deep in the lung structure, the air escaping into the interlobular connective tissue. It is not a very serious condition, rarely produces symptoms and affords no physical signs. It usually results from violent acts of coughing in which the expiratory strain is very great, as in whooping cough and in bronchial asthma; also, from wounds of the lung.

Pathology.—The air bubbles escape into the interlobular septa and are sometimes seen like little rows of beads outlining the lobules. The pleura may become detached and larger vesicles may form. In rare cases the rupture may take place at the root of the lung and the air passes along the trachea into the subcutaneous tissue of the neck and chest wall which gives rise to a very peculiar and distinctive crepitation upon palpation. Rarely there is rupture of the superficial vesicles, setting up pneumo-thorax.

VEISCULAR EMPHYSEMA.

Definition.—Dilatation of the infundibular passages and alveoli or an increase in their size either, symmetrical, in-

volving both lungs; or localized. Vesicular emphysema is divided into compensatory, hypertrophic and atrophic forms.

COMPENSATION.

This occurs when a region of the lung has been disabled from any cause and does not expand fully in inspiration, the healthy portion of the lung must distend and do vicarious work or the chest wall will sink in to occupy the space. This happens in the portions of healthy lungs in the neighborhood of tubercular areas and cicatrices, areas of collapsed lung or parts prevented from expansion by pleuritic adhesions (in this case the compensatory emphysema is chiefly at the anterior-margins of the lungs). As a rule this distention is physiologic and beneficial, the alveolar walls being stretched but not atrophied; only rarely do they atrophy when the air cells may fuse producing true emphysema.

HYPERTROPHIC EMPHYSEMA.

Definition.—This is enlargement of the lung due to dilatation of the air vesicles and atrophy of the walls.

Etiology.—The cause of emphysema is generally found to be due to derangements of the tissues, usually vertebrae and ribs, which affect the innervation to the lung tissues. Such lesions are found in the vagi and spinal dorsal nerves. The atlas may be involved but generally the ribs and dorsal vertebrae. Congenital weakness of the lung tissues probably due to non-development of the elastic tissue is a predisposing factor. This disease has a markedly hereditary character and frequently starts early in life. The heightened pressure within the air cells upon an already weakened lung tissue produces emphysema. Hence the obstinate cough of chronic bronchitis and expiratory straining of asthma are sometimes causes. In all attacks of severe coughing or straining efforts the glottis is closed and the air is forced into the upper part of the lungs, forcibly expanding them and here is where

emphysema is found to be most advanced. This disease is also found in players of wind instruments, in glass blowers and in those whose occupation necessitates heavy lifting or straining.

Morbid Anatomy.—The thorax is barrel shaped. The lungs are enlarged and do not collapse when the thorax is opened as they have lost their elasticity. The organs are pale, soft and downy to the feeling and pit on pressure. Enlarged air vesicles may readily be seen beneath the pleura. Microscopically, there is seen atrophy of the vesicular walls and a diminished amount of elastic tissue. There is more or less obliteration of the capillaries, and the epithelium of the air cells undergoes a fatty change. There is usually chronic inflammation of the bronchial tubes which may be roughened and thickened and the longitudinal lines of the submucous elastic tissue stands out prominently.

The diaphragm is lowered and the subjacent viscera are displaced. The most important morbid changes are found in the heart. The right chamber being dilated and hypertrophied. This is caused by the increased tension in the pulmonary artery which is enlarged and the seat of atheromatous degeneration. In long standing cases the hypertrophy is general. A change in the liver, kidneys and other viscera are those associated with prolonged venous engorgement.

Symptoms.—The approach of the disease is usually gradual. The first symptom to be noticed is the shortness of breath. In rare cases it may exhibit a more acute development as after whooping cough and then the first symptom will be dyspnoea. In some cases this persists all the time while in moderate emphysema the dyspnoea is noticed only on slight exertion, such as going up stairs, running or walking rapidly. The lungs are always filled with air which is charged with carbonic acid and does not change as the pa-

tient is constantly making ineffectual efforts to draw in air. The inspiration is shortened and the expiration is greatly prolonged and is often harsh and wheezy. The pulse rate is accelerated, the temperature is usually normal. Cyanosis is a characteristic symptom in well established cases and is of an extreme grade not seen in any other affection. Bronchitis is frequently found in combination and especially in winter. In this case there will be the symptoms of the associated bronchitis, cough, expectoration and sometimes oppression. As the patient advances in age and there are successive attacks of bronchitis the condition gets worse. In advanced cases as the result of cardiac failures there may be venous engorgement, dropsy and effusions into the serous sacs.

Physical Signs.—*Inspection.*—There is a marked change in the shape of the thorax. The chest is rounded with increased circumference giving it the characteristic barrel shaped chest. The sternum bulges and also the costal cartilages. The intercostal spaces are wide, especially in the hypochondriac region and narrow above. The clavicles and muscles of the neck stand out with great prominence and the neck itself seems to be shortened on account of the elevation of the thorax and sternum. The curve of the spine is increased and there is a winged condition of the scapulae. These changes give the patient a stooping posture. The chest does not expand but is raised up by the scaleni and sterno-cleido-mastoid muscles which stand out prominently and are hypertrophied. The heart's apex beat is invisible and there is usually marked epigastric pulsation.

Palpation.—Vocal fremitus is diminished but not absent, the apex beat is rarely felt. There is distinct shock over the ensiform cartilage; this is due to the displacement of the heart and engorgement of the right ventricle. There is marked pulsation in the epigastrium.

Percussion.—There is increased resonance sometimes almost amounting to tympany. The upper level of the hepatic dullness is depressed. The heart dullness may be obliterated and the upper limit of splenic dullness may also be lowered. The percussion note is greatly extended.

Auscultation.—The inspiration is short and feeble while there is prolonged expiration, the normal ratio being reversed. In associated bronchitis râles are frequently heard. The pulmonary second sound is accentuated.

Diagnosis.—Unless complicated the diagnosis is generally easily made.

Chronic Bronchitis.—The enlargement of the thorax with dysponea and hyper-resonance and a prolonged expiration will differentiate emphysema from bronchitis.

Pneumothorax.—Is of sudden development while emphysema is of slow development. Pneumothorax is almost always unilateral; and it gives a tympanitic percussion note. In auscultation there is amphoric breathing and metallic tinkling and absence of any vesicular murmur.

Prognosis.—The disease is rarely fatal although death may result from heart failure, dropsy or pneumonia. Thorough and persistent treatment will generally relieve the primary condition. The disease as a rule runs a long course but does not necessarily shorten life.

Treatment.—In cases of recent occurrence one may be able to build up the altered lung tissue by treatment of the innervation to the lung structure, viz.: the vaso-motor nerves from the second to the seventh dorsal, the vagi nerves, and the cervical and dorsal sympathetic nerves. When a number of air vesicles have been converted into one sac it is impossible to restore the altered lung structure and a treatment to relieve the symptoms and to prevent the further progress of the disease can only be given. In all cases treatment should be applied to correct any vertebrae or rib of

the upper dorsal region that may be displaced, and to raise and spread the ribs so that the lung structure may be better nourished and strengthened and that the aëration of the blood will be more perfect. Treatment of the vagi nerves are important as their physiological action on the lungs is to increase their movement.

The general health of the patient is an important consideration and everything should be done to promote as healthy a condition of the patient as possible. The digestion of the patient should be carefully looked after and everything done to restore a normal state of the blood.

Strengthening the cardiac action will be of service in relieving any dropsical tendency that might occur on account of obstruction to the pulmonary circulation. If bronchitis or asthma occurs their respective treatments should be given. A general treatment of the splanchnic and lung vascular areas should be given to prevent any disturbance in the circulation and thus cause congestion of the liver, congestion of the haemorrhoidal veins, or catarrh of the stomach and bowels.

It is a good plan to instruct the nurse or attendant to aid inspiration and expiration by raising the arms strongly above the head during inspiration and to compress the chest during expiration so as to comcide with natural breathing which will render the aëration of the blood greater and increase the elasticity of the vesicles.

CROUPOUS PNEUMONIA.

Synonyms.—Lobar pneumonia; pneumonitis; lung fever; fibrous pneumonia; genuine pneumonia.

Definition.—An acute infectious disease caused by the micrococcus lanceolatus which produces a local inflammation of the parenchyma of the lung and by its toxins marked constitutional disturbances, chill, extreme prostration and

fever which terminates abruptly by a crisis. Secondary infective processes are frequent.

Etiology.—Age, sex and climate exert little predisposing influence. Males are on the whole more frequently attacked. Pneumonia frequently follows injuries of the chest. Various derangements of the ribs and vertebrae are always found in pneumonia; such derangements as correspond with the regions of vaso-motor, motor and trophic fibres of the lungs, viz., second to seventh dorsals inclusive and the upper cervical vertebrae, the latter region affecting the vagi. The muscles of the chest region are always severely contracted. These various disorders produce a lowered vitality of the bronchial and lung tissues thus favoring the existence of the micrococcus lanceolatus. Unhygienic surroundings, alcoholism, any or all habits that tend to depress the nervous system, or lowered vitality from some pre-existent disease, like diabetes, Bright's disease, organic heart affection or one of the infectious fevers, favor its development. One attack undoubtedly predisposes to another and repeated attacks may occur in the same individual. The exciting cause is the invasion of the lung by pathogenic bacteria, especially by Frankel's diplococcus pneumoniae.

Morbid Anatomy.—The lung in croupous pneumonia exhibits three distinct stages—congestion, red hepatization and gray hepatization.

Stage of Engorgement.—The lung tissue is deep red in color, firmer to the touch, more solid and less crepitant than the healthy lung. On section the surface is bathed in blood and stained serum, and the excised portions float. Microscopic examination shows the capillaries to be dilated and tortuous. The alveolar epithelium is swollen and the air cells filled with a variable number of red corpuscles, detached alveolar cells and a few leucocytes.

Stage of Red Hepatization.—The affected tissue is solid,

firm and airless. Usually an entire lobe is involved; it looks voluminous and shows indentations of the ribs. It is reddish brown in color and on section presents a dry mottled appearance. It is very friable and does not crepitate, as the affected portion is airless. Its weight and specific gravity are increased so that it sinks in water. The torn surface presents a granular appearance which is due to the minute fibrinous plugs which fill the air cells.

Microscopic examination shows the air spaces filled with coagulated fibrin in the meshes of which are red blood discs, pus cells and alveolar epithelium. The alveolar walls are infiltrated and leucocytes are seen in the interlobular connective tissue. In sections properly treated the diplococcus is detected, and in some cases also streptococci and staphylococci.

Stage of Gray Hepatization.—The lung is still dense and heavy but the surface is moister and softer while the lung tissue is even more friable and the red color gives place to a mottled gray. The exudate loses its granular character and a yellowish white purulent liquid flows from a cut surface. At least one-half of the fatal cases die in the early part of this stage.

Microscopic examination shows the air cells densely filled with leucocytes while the red corpuscles and fibrin filaments have disappeared. The stage of gray hepatization is the stage of beginning resolution. The exudate is now softened. The cell elements are disintegrated, and absorbed by the lymphatics.

In unfavorable cases the consolidated lung may become infiltrated with pus and abscesses may be formed. It may become gangrenous or it may become the seat of fibroid induration. This, however, is very rare.

Symptoms.—The disease begins abruptly, usually with a severe chill, lasting from half an hour to an hour, the fever

rising rapidly. There is a sharp pain in the side, the skin becomes harsh and dry, the face is flushed, the eyes are bright and the expression anxious. A short dry, painful cough soon develops. The expectoration presents a characteristic, rusty or blood tinged appearance and is extremely tenacious. The temperature rises rapidly to 104 or 105 degrees and continues high for from five to ten days and generally terminates by crisis. The pulse is full and bounding but the pulse-respiration ratio is not maintained. There is marked dyspnoea, the respirations ranging from forty to fifty per minute. Examination of the lung shows the physical signs of consolidation—blowing, breathing and fine râles. Headache, sleeplessness, epistaxis, rarely delirium except in drunkards, may also be present.

The symptoms given are those of a typical case of pneumonia, but they are all subject to modification. The onset may be gradual and the chill absent. In all persons and especially drunkards, the temperature may not be near so high and the pulse is often feeble and rapid instead of full and strong; and the physical signs may not make their appearance until the second or third day.

Special Symptoms.—The sputum at first is mucoid and frothy. About the second day it becomes of a characteristic color, quite copious and consisting of a frothy fluid mucus and containing small viscid masses of a yellowish color. It is very viscid and glutinous, in some cases almost from the onset. It consists largely of pure blood. In old and previously weak persons there may be no expectoration at all.

Under the microscope the sputum is seen to contain red blood corpuscles, leucocytes, alveolar epithelium in various stages of degeneration, the micrococcus lanceolatus as well as other micro-organisms, pus corpuscles and small fibrinous casts.

The Urine.—The urine is febrile, scanty and high-colored;

urea and uric acid being notably increased. The chlorides may be absent or greatly reduced, although they are not constantly lessened and they are now considered of little diagnostic value. It is supposed that they are transferred to the exudate in the lung. A trace of albumin is often present.

Cutaneous Symptoms.—Herpes is common. The naso-labial herpes appear from the second to the fifth day and they may occur upon the cheek, genitals and upon the mucosa of the tongue. It is supposed to indicate a favorable prognosis. There is redness of the cheek usually on the affected side. Sweats are not uncommon at the height of the disease, but at the crisis they may be profuse.

Gastro-intestinal Symptoms.—The mucous membrane of the mouth is dry. The tongue is white and furred and in cases of a low type it becomes dry and brown. Anorexia and thirst are present. The patient is usually constipated but diarrhoea may occur. Vomiting is not uncommon at the onset and may be repeated. The spleen is usually enlarged but the liver is not perceptibly increased in size, unless there is extreme engorgement of the right heart.

Circulatory Symptoms.—The pulse is full and bounding. The average pulse rate is from 100 to 108 per minute. It is not often dicrotic. With complete and extensive consolidation the left ventricle receives a lessened amount of blood and the pulse in consequence may become small. In the aged and debilitated a small weak and rapid pulse may be present from the onset. The heart sounds are usually loud and clear and in favorable cases the pulmonary second sound is accentuated owing to the increased tension in the pulmonary vessels. With distention of the right chambers and failure of the right ventricle the second sound becomes less distinct which is a very unfavorable symptom, for very much

depends upon the strength of the right ventricle in pneumonia.

Blood.—This exhibits usually leucocytosis which appears early but disappears with a crisis. In malignant pneumonia this is absent and its continued absence is an unfavorable sign. The proportion of fibrin is also greatly increased. The diplococci can very rarely be seen.

Cerebral Symptoms.—Headache is common as an initial symptom and may be a persistent feature. The disease is often ushered in by convulsions especially in children; consciousness is usually retained throughout the whole attack, even in severe cases, though in some cases there is delirium. In drunkards *delirium tremens* may be present from the onset. In these cases the patient often wanders about until the preliminary excitement gives way to coma which deepens into death.

The Fever.—The fever rises abruptly in the initial chill, the temperature reaching 104 or 105 degrees, and is continuous with a variation of a degree or two. The fever terminates by crisis after having continued from five to nine days. The temperature usually falls during the night and is accompanied by a profuse perspiration. The temperature may fall from five to eight degrees in eight to twelve hours.

Physical Signs.—Stage of Congestion.—*Inspection.*—Diminished expansion, the movements of the affected side are defective, the face is flushed and the patient lies on the affected side.

Palpation.—Tactile fremitus is slightly increased.

Percussion.—There may be tympany over the involved area from diminished intrapulmonary tension. In the latter part of this stage there is impairment of resonance.

Auscultation.—Fine crepitant râles are heard at the end of forced inspiration. Over the normal part of the lung there is exaggerated vesicular breathing.

Second Stage, Red Hepatization.—*Inspection.*—The breathing is markedly abnormal. There is little or no expansive motion of the chest over the affected area.

Palpation.—Vocal fremitus is markedly exaggerated. The skin is hot and dry and the pulse frequent.

Percussion.—Dullness upon the affected parts with an increased sense of resistance.

Auscultation.—There is high-pitched prolonged bronchial or tubular breathing when the lung becomes solidified. When the larger bronchi are completely filled with exudate tubular breathing is absent. Crepitant râles may also be heard and bronchophony is generally obtainable.

Stage of Gray Hepatization.—Largely the same physical signs are repeated in this stage as in the second. The normal manner of breathing gradually returns as does also the normal expansive movement of the affected side. Crepitant râles reappear. The temperature of the skin is lessened, breathing changes from bronchial to vesicular and bronchial resonance continues for some time.

Terminations in Unfavorable Cases.—*Purulent Infiltration.*—The intestinal tissue becomes infiltrated with pus cells which also fill the air spaces. The lung tissue becomes soft and friable. This impairs the lung tissue as a result of the purulent infiltration and the breaking down of the septa produces abscess of the lungs.

Abscess.—Usually the abscesses are not large but they may occupy an entire lobe. In such cases the constitutional symptoms are usually severe. The fever continues high and there is expectoration of pus containing elastic tissue.

Gangrene may rarely follow. It is recognized by the horrid fetid odor of the expectoration which contains large quantities of the elastic tissues from the lungs.

Fibroid Induration.—This may occur, but very rarely.

The cut section is found to be smooth and grayish in color with characteristic yellow spots due to fatty cells. The alveoli become blocked with connective tissue and their walls thickened. The fibrinous plugs in the air cells may also be transformed into connective tissue.

Complications.—*Pleurisy* is the most frequent complication. Pneumonia on one side and pleurisy on the other is quite possible. The pain is more acute and localized. The respiration is greatly affected and the usual signs of effusion are present.

Pericarditis is more common in the pneumonia of children. Though usually plastic it may be sero-fibrinous, but rarely the fluid is purulent. There is increased dyspnoea, the pulse becomes weaker and the heart sounds are gradually suppressed.

Endocarditis is a comparatively frequent complication. It is more liable to attack persons with old valvular disease and to affect the left heart. The physical signs are sometimes absent and even when present are liable to be very deceptive. It may, however, be suspected in cases where the fever is protracted, when septic manifestations develop such as chills, sweats or irregular temperature, when embolic symptoms appear, or when a rough diastolic murmur develops.

Meningitis is the most important complication and usually comes on at the height of the fever. This complication is rarely recognized unless the basilar meninges are involved. It is frequently associated with ulcerated endocarditis. Cerebral embolism causing hemiplegia has been observed.

Peripheral neuritis is among the rare complications.

Gastro-intestinal Complications.—Croupous colitis may give rise to tympanites and severe diarrhoea. Jaundice is fre-

quent in severe cases but may be observed in all types. It is rarely severe and sets in early.

Diagnosis.—A typical case of pneumonia is easily recognized. The abrupt onset with rigor, the rapidly developed fever, the sputa, physical signs and abnormal pulse-respiration ratio, as a rule make the diagnosis easy. Frequent examination of the lungs should be made in Bright's disease, diabetes, organic affections of the heart, cancer and alcoholism, as all these affections are liable to become complicated with acute pneumoina.

Pleurisy is oftener confounded with pneumonia than any other disease. The resemblance between friction sounds and crepitant râles is often very close. In pleurisy vocal resonance and vocal fremitus are diminished, there is no "rusty" sputum, the percussion dullness may change with the posture of the patient and the breathing is distant and weak.

Typhoid Fever.—Typhoid pneumonia may be mistaken for typhoid fever with pneumonia. Hypostasis occurs late in typhoid fever while dullness sets in early in pneumonia. The history of the onset will be of aid, as pneumonia as a complication sets in late in the disease.

Acute Phthisis.—This may begin with a chill and may resemble pneumonia very closely, especially the physical signs. Examination of the sputa will show the bacilli of tuberculosis.

Prognosis.—This largely depends upon the previous health of the patient. At the extremes of life the prognosis is very much more unfavorable. It is especially fatal in drunkards. The average mortality of the "old schools" is about twenty per cent, but there is no doubt that great blunders have been made in the treatment of pneumonia to render such a high death rate. By competent osteopathic treatment this rate may be much lessened and this dreaded

disease for both physician and patient need not seem so fearful.

Treatment.—The treatment of pneumonia must be both constitutional and local. By this I mean the systemic strength and vigor must be maintained in addition to treatment of the chief lesion of the disease, which is located in the lungs. Pneumonia is recognized by the best clinicians as an infectious disease closely analogous to typhoid fever. Practically the same manifestations are presented in both diseases, about the only difference being the habitat of the micro-organism; in one disease diarrhoea occurring and in the other usually constipation. Both diseases attack chiefly the nervous system.

During the various stages of the disease the treatment should be directed to the nerves of direct innervation that control the capillaries, and to the vaso-motor nerves of the pulmonary circulation, in order that the hyperaemic and inflamed state of the pulmonary capillaries and adjacent tissues may be lessened and the circulatory system equalized. The disordered tissues that should be corrected in order that the centers of the spinal cord and the nerves that influence the function and structure of the lungs may be relieved, are: contractions of the thoracic and dorsal back muscles, luxations and subluxations of the ribs and dorsal vertebrae from the second to the seventh inclusive, and the upper cervical vertebrae that may become disordered and impinge upon the vagi nerves. Also, carefully treat the middle and inferior cervical regions for the lymphatics of the lungs. Each of these regions should be carefully examined and thoroughly treated whenever found involved. The specific micro-organism that influences the course of pneumonia is naturally a very important factor; but watching and improving the general health, and establishing an unobstructed circulation through the diseased lung tissues will hasten the crisis by

favoring a rapid formation of antidotal substances to neutralize the poisonous albumin produced by the micrococcus lanceolatus of Fraenkel. Healthy tissues which occur only when there is uninterrupted freedom of vascular supply and nerve force are gained by correction of any and all anatomical disorders. This will rapidly decrease any lethal tendency in the patient and at once abort the cause of the disease so that all that remains to be done is sufficient time for nature to heal the diseased tissues. Thus the predisposing cause of specific disease, as in all diseases, is some disorder of the anatomical tissues so that normal physiological functions are interfered with; and the determination of the different courses of disease is by a difference in location of the lesion and a difference in the life period of the micro-organism involved in each disease. All that is necessary in every case is a correction of the mechanical predisposing condition and the exciting determining influences will be rendered inactive at once.

The importance of close attention to both the vagi can not be overestimated. Any obstruction above or below the origin of the superior laryngeal nerve is followed by loss of motor power of the lungs, thus causing difficult and labored breathing. The lungs become surcharged with blood because the air pressure in the lungs is low and the thorax is distended. This condition is followed by serous exudation. Thus obstruction of the vagi may be one factor in the cause of pneumonia. Obstruction of the vagi below the origin of the recurrent laryngeal nerves affects the lower and middle lobes of the lungs, producing also a catarrhal inflammation of the upper lobes. The recurrent laryngeal nerves may be obstructed by dilatation of the aorta or subclavian artery as they wind about them; also by dislocations of the first and second ribs, which may affect the nerves not only directly but by causing an obstruction to the subclavian ves-

sels with a consequent disturbance of the aorta and heart. The recurrent laryngeal nerves may be treated directly at the inner lower part of the sterno-mastoid.

One of the chief aims of the treatment should be to prevent heart failure and to lessen the pulse respiration ratio. The average pulse rate in typical cases is from 100 to 110 per minute and when it exceeds this to any extent, say 120, there is cause for alarm. At first the pulse is full and bounding, later it is small on account of a lessened amount of blood reaching the left ventricle and systemic circulation on account of the extensive consolidation. In treating heart failure particular attention should be paid to the condition of the ribs on the left side over the region of the heart, the second to the fifth and inclusive. A correction of any disturbance to the inhibitory nerves to the heart, the vagi, and the accelerator fibres of the heart, the cervical sympathetic, should be made. General treatment of the entire system will relieve the heart of some work and favor an equalization of the vascular system. Also by the use of hydrotherapy the maintenance of the heart's action may be accomplished. Cold compresses and not warm ones should be used, as the latter relax the vessel walls producing more or less paresis of the vessels while the former stimulates the vaso-dilators producing dilatation and tone of the vessels thereby causing a vigorous increase in the flow of blood. This relieves the heart by increasing the cutaneous circulation, besides increasing arterial tension. Thereby the right heart is indirectly aided by the increase of the tension in the general vascular system, and the vessels of the pulmonary circulation have more force expended upon them and a greater contraction of their vessels occurs on account of the dilatation of the cutaneous vessels. The temperature of the water used should be 60 degrees F. and the compress applied for thirty minutes or as long as necessary.

In addition to the fever treatment in the cervical region the gradually-cooled tub-bath will be of aid. The temperature at first being ninety degrees F. and then gradually cooling to eighty degrees F. The duration should not be over ten or fifteen minutes. Care should be taken that the patient does not exert himself. He should be lifted in and out of the baths. These baths also have a marked effect upon the respiratory and nervous centers.

During all stages of the disease care should be taken of the patient in the best possible manner. The apartment should be well aired and a temperature of 65 degrees F. maintained. In the very young the temperature should be higher. The diet is exceedingly important. Give a liquid, light and nutritious one, a milk diet being preferable. Otherwise give meat juice, broths, egg albumin and whey. Avoid starchy and saccharine foods, and give plenty of water. Good nursing and complete rest of body and mind with careful attention to the activity of the bowels, kidneys and skin will aid indirectly the clogged up lung fascia to perform its function and hasten an early recovery from the disease.

BRONCHO-PNEUMONIA.

Synonyms.—Capillary bronchitis; catarrhal pneumonia; lobular pneumonia.

Definition.—An inflammation of the minute bronchi and air vescicles. The affection begins with an inflammation of the capillary bronchi which extends to the air vescicles.

Etiology.—The disease is most prevalent among the very young and the old. It may occur as a sequence or in association with measles, diphtheria, whooping cough and scarlet fever. Broncho-pneumonia seldom occurs as a primary disease. Exposure to cold, impure air, rickets and diarrhoea are marked predisposing causes in children. In the old debilitating affections and chronic diseases are predisposing

causes. Broncho-pneumonia occurs sometimes as a complication in small pox, erysipelas, typhoid fever and influenza. The principal lesions found upon examination are subdislocated ribs affecting the pulmonary vaso-motor nerves. The third, fourth and fifth ribs are especially apt to be dislocated. The muscles throughout the thoracic region are generally severely contracted. Another group of cases, the so-called aspiration or deglutition pneumonia, are caused by the inhalation of food particles or other substances. Whenever the sensitiveness of the larynx is benumbed as in comatose states from any cause, small particles of food are allowed to pass the rima reaching the smaller bronchi producing intense inflammation which may even cause suppuration and sometimes gangrene. Cases are liable to occur after operations about the nose and mouth. It is often secondary to carcinoma of the larynx and oesophagus and after tracheotomy and glosso-pharyngeal palsy. A very frequent and fatal form of broncho-pneumonia is caused by the tubercle bacillus.

Morbid Anatomy.—Both lungs are usually involved and become heavy. On the pleural surfaces especially at the base, sunken purplish or slaty patches are noticed, representing collapsed lung tissue. On section small projecting portions of consolidation are seen, separated from each other by uninflamed and collapsed tissue; the section of lung tissue is of a dark reddish color. The terminal bronchi are filled with tenacious purulent material. Microscopically the terminal bronchi and air cells are filled with a plug of exudation composed of leucocytes and desquamated epithelium. The walls of the bronchi are swollen and infiltrated with leucocytes.

Symptoms.—The symptoms are frequently marked by those of the primary affection. The onset is usually gradual. The child becomes feverish; there is increased frequency in

the respiration and there is an aggravated cough. The temperature rises to 102 or 104 degrees F., the respiration may rise as high as 60 or even 80 per minute. The cough is hard, distressing, frequently painful and accompanied by a muco-purulent expectoration. The pulse is greatly accelerated—120 to 180 per minute. As the disease advances signs of deficient aëration of the blood are noticed. At first there is a pale and anxious expression of the face, the lips are blue and the child makes strenuous efforts to breathe. The blood soon becomes highly charged with carbon dioxide and by its benumbing influence upon the nerve centers sensibility is reduced and the cough and suffering subside. The face becomes livid and death may occur within twenty-four hours from paralysis of the heart.

Physical Signs.—At the beginning of the attack dullness is absent and subcrepitant and sibilant râles are present. Areas of consolidation soon become manifested. There is slight impairment of resonance and the breathing is harsh. Upon inspection there is in grave cases retraction of the base of the sternum and of the lower cartilages pointing to defective expansion of the lung.

Diagnosis.—This is usually easy, developing as it generally does in the course or at the conclusion of another disease, with a gradual onset as a rule and irregular fever and a long duration, besides usually occurring in children under five. If the areas of consolidation are large involving the greater part of a lobe it is sometimes very difficult to distinguish bronchial pneumonia from lobar pneumonia.

Differential Diagnosis.—Lobar pneumonia when occurring in children is usually between the ages of five and fifteen. The onset is abrupt in a child of good health, it resolves rapidly, there is rusty colored sputum and continued fever falling by crisis.

Tuberculous Broncho-Pneumonia.—It is very hard to de-

cide between this and simple broncho-pneumonia. A great many cases can be correctly diagnosed only after the lapse of considerable time. The presence of signs of softening, considerable disease of the apices, and examination of the sputum or in the case of a child, of the vomited matter,would diagnose this form. If elastic fibres and tubercle bacilli are found in the sputum or vomited matter the diagnosis is at once decided in favor of tuberculous broncho-pneumonia.

Prognosis.—The prognosis depends on the cause. In children that are previously weak and debilitated the disease is very fatal. When the disease follows measles and whooping cough the fatality is not so great. In adults the prognosis is about the same as in the croupous form. The deglutition variety is very fatal.

Treatment.—A great deal can be done to prevent the disease by careful attention to debilitated children in keeping them warm and protected at all times. In measles and whooping cough during convalescence the child should be well taken care of.

A thorough persistent treatment of the dorsal vaso-motor nerves posteriorly should be given. Derangements to the third, fourth and fifth dorsal nerves are most likely to be found; the principal vaso-motor innervation to the bronchials and air vesicles is from this region. Treatment over the chest anteriorly is also of great aid, especially an upward and outward manipulation of the ribs should be given. Attention should be given the vagi nerves to increase the activity of the lungs as well as for the effect gained upon the circular fibres of the bronchi. Care should be taken that the first rib is not impigning upon the first thoracic ganglion.

Ice bags over the chest are helpful. The chest should be protected from changes in temperature by a jacket of cotton batting. The diet should consist of milk, egg albumin

and broths. Keep the temperature at about 70 degrees F. and the air of the room moist and free from draughts of air. When the fever is high, sponging or the wet pack is helpful. The bowels from the beginning of the attack should be carefully watched.

There is danger of a failing heart; this is generally associated with mucous râles and cyanosis. Douching alternately with hot and cold water will usually excite coughing and overcome the difficulty. The gradually cooled bath will have a marked effect in reducing the temperature, quieting nervous symptoms, increasing the respiratory power and promoting sleep.

CHRONIC INTERSTITIAL PNEUMONIA.

Synonyms.—Cirrhosis of the lung; fibroid induration; chronic pneumonia.

Definition.—A chronic inflammatory disease of the lungs, characterized by an overgrowth of fibrous or connective tissues.

Etiology.—With few exceptions chronic affections of the lungs cause more or less fibroid overgrowth. This is especially frequent after bronchial pneumonia and pulmonary tuberculosis. It is also excited by abscesses, hydatids, syphilis, emphysema, sarcoma and old fibrinous pleurisy. It may also be caused by compression, by aneurism or neoplasms. It may arise as a primary affection due to the inhalation of irritating dusts (stone dust, coal dust and metal dust).

Morbid Anatomy.—According as it involves limited or extensive areas it is recognized as local or diffuse. It is a unilateral affection. The involved portion is shrunken and on section it is found to be tough, firm, of a greenish color and containing an overgrowth of fibrous tissue. If it affects the left side the heart may be displaced. The unaffected lung

is usually enlarged (compensatory emphysema). There is hypertrophy of the right ventricle of the heart.

Symptoms.—There is a chronic cough which varies greatly in its severity, moderate dyspnoea and a variable expectoration. There is no fever and the general health of the patient may be well preserved for a number of years. The expectoration is generally copious muco or sero-purulent, rarely fetid.

Physical Signs.—Inspection.—There is retraction of the affected side, displacement of the apex beat and lateral curvature of the spinal column. The unaffected side is enlarged. The intercostal spaces disappear, the ribs sometimes even overlapping.

Palpation.—The tactile fremitus is generally increased but if the pleuro-membrane is thickened the fremitus may be decreased.

Percussion.—There is generally impairment of resonance. A tympanitic or amphoric note may be heard over a dilated bronchus. On the sound side the percussion note is generally hyper-resonant.

Auscultation.—The breathing sounds may be feeble. They may be bronchial or cavernous, but rather amphoric. Late in the disease cardiac murmurs are not uncommon.

Diagnosis.—This is never difficult. It is mainly to be distinguished from fibroid phthisis. In the latter both lungs are involved and there is fever and bacilli are found in the sputa.

Prognosis.—The disease is exceedingly chronic and may last for many years. Death may result from gradual failure of the right heart, haemorrhage or from intercurrent attacks of acute pneumonia involving the other lung.

Treatment.—Little can be done for this condition. Intercurrent bronchitis may be somewhat relieved by the treatment for chronic bronchitis. The patient should dwell in

a mild climate. Hygienic surroundings and nutritious food are indicated. Possibly something can be done by attempting to correct the condition of the ribs and vertebrae.

DISEASES OF THE PLEURA.

PLEURISY.

Synonym.—Pleuritis.

Definition.—An inflammation of one or both pleural membranes.

Varieties.—Etiologically it may be divided into primary and secondary pleurisy. According to the cause of the disease into acute and chronic pleurisy. Anatomically the cases may be divided into dry pleurisy and pleurisy with effusion (sero-fibrinous, purulent, haemorrhagic).

ACUTE PLEURISY.

Synonyms.—Finbrinous or plastic pleurisy.

The affection may be primary or secondary. As an independent affection it is rare. It may follow exposure to wet and cold or it may be due to mechanical injury. The disease may set in with pain in the side, slight fever and the friction sound of pleurisy may be present. These symptoms last a few days and then disappear and no exudation occurs. The pleural surfaces become more or less united.

As a secondary process dry plastic pleurisy arises from extension of the inflammation in acute or chronic diseases of the lung, especially pneumonia Abscesses, gangrene and cancers also cause plastic pleurisy It sometimes arises in acute articular rheumatism and in a large number of cases is associated with tuberculosis. This condition may be a complication in chronic Bright's disease and in chronic alcoholism.

In the fibrinous form of pleurisy the serum is scant and the membrane is covered with a sheathing of lymph which

subsequently organizes and adhesion takes place between the opposing surfaces.

SERO-FIBRINOUS PLEURISY.

This form is known as pleurisy with effusion. There is little lymph, the exudate being mainly composed of serum.

Etiology.—Many cases follow rapidly exposure to cold, wet or an injury to the thorax. Exposure to cold is now considered as a mere predisposing agent permitting the action of various micro-organisms. The large majority of cases are due to tuberculous infection of the pleura.

The osteopathic physician finds that the predisposing causes of pleurisy in any instance are injury to the chest wall, ribs and vertebrae and exposure to cold, causing contraction of the thoracic muscles. These injuries and strains throughout the chest causes an interference with the intercostal and phrenic nerves, and with the intercostal and internal mammary arteries, consequently producing a lowering of vitality of the pleural tissues and permitting the attack of the micro-organisms.

It may be secondary to rheumatism, Bright's disease, cancer and cirrhosis of the liver.

Morbid Anatomy.—There is an abundant exudation of serum. Fibrin is found on the pleura and is rarely abundant in the serous fluid in the form of flocculi. The fluid is straw colored as a rule, rarely it is dark brown. It varies greatly in quantity from one-half to four litres. Microscopically there are found leucocytes, a variable number of red corpuscles, shreds of fibrin and occasionally cholesterin, uric acid and sugar. The composition of the fluid resembles blood serum. On boiling it is found to be rich in albumin.

Various displacements of the adjacent organs are caused by the effusion. The lung is more or less compressed into the back part of the pleural sac. The heart is displaced.

The diaphragm may be displaced downward. On the right side this lowers the liver; on the left it displaces the stomach, transverse colon and sometimes the spleen.

Symptoms.—The onset may be abrupt with a chill, severe pain in the side and fever. With few exceptions the disease comes on insidiously, pain in the side being the first symptom. The pain is sharp and cutting and is aggravated by breathing or coughing. There is moderate fever, the temperature ranging from 102 to 103 degrees F. Dyspnoea may be present at the onset and is due partly to the fever and partly to the pleuritic pain. When the fluid is effused slowly dyspnoea may be absent, except on exertion. It is most marked when the effusion has developed rapidly. As the effusion accumulates and the inflamed surfaces separate the pain diminishes and as a rule soon disappears.

Physical Signs.—Inspection.—Immobility and bulging of the affected side depending upon the amount of the exudation. The intercostal spaces are obliterated. The apex beat of the heart is displaced.

Palpation.—The limited movement of the chest is more accurately determined. Tactile fremitus is greatly diminished and soon abolished. The position of the heart's impulse can be readily located by palpation. Displacements of the liver and spleen can be felt through the abdominal walls.

Percussion.—At first the percussion notes are impaired and later there is dullness which gradually rises as the fluid increases. The upper line of dullness is not horizontal when the patient is in the erect posture but is higher behind than it is in front. Above the effusion in the sub-clavicular region percussion gives a tympanitic note, the so-called Skoda's resonance. In moderate effusions the level of dullness often changes with the position of the patient.

Auscultation.—Early in the disease a friction rub can usually be heard. As the fluid accumulates the breath sounds

become weak, distant and may have a tubular or bronchial quality. Vocal resonance is usually diminished or absent. There may, however, be bronchophony or it may manifest a nasal or metallic quality resembling somewhat the bleating of a goat (Laennec's egophony).

Mensuration.—Allowance must be made for the fact that in right-handed adults the right side is naturally larger than the left. The affected side is sometimes an inch or more larger than the sound one.

Duration.—The course of acute sero-fibrinous pleurisy is very variable. The fever is due to inflammation and may last for two or three weeks, when it may subside. The cough and pain disappear and the effusion which is usually slight in these cases may be absorbed quickly. In cases where the effusion is poured out rapidly it may be absorbed just as rapidly. In cases in which the effusion is poured out slowly or where the effusion reaches as high as the fourth rib recovery is usually slower. Large effusions may persist without change for months and finally the case may become subacute or chronic. This is particularly true of tuberculous cases.

Prognosis.—This depends largely upon the cause. Death is a rare termination of sero-fibrinous effusion, death may however occur suddenly without sufficient lesions to explain the cause. The exudate may become purulent.

PURULENT PLEURISY.

Synonym.—Empyema.

Definition.—A suppurative inflammation of the pleura.

Etiology.—It is often secondary to a sero-fibrinous pleurisy. It frequently follows the infectious fevers, especially scarlet fever, less frequently typhoid fever, measles and whooping cough. In children the effusion in many cases becomes purulent early and many cases are probably purulent from the beginning. Fracture of the ribs, penetrating

wounds, malignant affections of the lungs or oesophagus and especially perforation of the pleura by tuberculous cavities are frequently followed by empyemia.

Upon bacteriological investigations the streptococcus, staphylococcus, micrococcus lanceolatus and tubercle bacillus are the organisms most commonly found. In many cases the pneumococci are present and as a rule these cases pursue a favorable course.

Morbid Anatomy.—On opening the pleural sac after death it is generally found that the fluid has separated into two layers—an upper layer of a clear greenish yellow serum and a lower thick purulent layer. In a few cases the exudate is fibrino-purulent. It usually has a heavy sweetish odor. When due to wounds it is generally fetid. It is horribly offensive when associated with gangrene of the lung or pleura. On microscopic examination it has the character of ordinary pus. The pleural membranes are greatly thickened.

Symptoms.—It may begin abruptly with acute symptoms such as rigor, high temperature, prostration and severe pain in the side. More frequently it develops gradually in the course of other diseases or it may follow sero-fibrinous pleurisy. The general symptoms are those of septic infections—chills, profuse sweating and irregular fever; in such cases there is a gradual loss of flesh with palor and weakness. In some cases the characteristic symptoms (pain in the side, cough and dyspnoea) may be entirely absent. Examination of the blood invariably shows leukocytosis. Empyema may perforate the neighboring organs as the oesophagus, pericardium, stomach or peritoneum. In rare cases the pus passes down the spine and along the psoas muscle into the iliac fossa and similate a psoas or lumbar abscess. It may also perforate externally or rupture into the lungs.

Physical Signs.—Practically they are identical with those of pleurisy with effusion, there are one or two, however,

which are more or less distinctive of the affection. In children oedema of the chest walls is frequently present and the affected side is greatly enlarged. There is obliteration or even bulging of the intercostal spaces. The displacement of the heart and adjacent organs is marked.

Pulsating Pleurisy.—This is a strange phenomenon associated usually with empyema. It is of rare occurrence and is met with in sero-fibrinous pleurisy. The heart impulse is forcibly communicated through the effusion. There is an external pulsating tumor and empyema which manifests no tendency to point externally. Its etiology is not definitely known.

Prognosis.—A purulent effusion if left alone may kill by sepsis or it may become inspissated or rarely encysted. Empyema is a chronic affection and in the majority of cases if left alone will end in death, a few cases recover.

SPECIAL VARIETIES OF PLEURISY.

Tuberculous Pleurisy.—It occurs as: (1) An acute affection with an abundant sero-fibrinous exudate. (2) Sub-acute pleurisy with insidious course; frequently preceding the development of pulmonary pleurisy. (3) Chronic adhesive pleurisy in which the pleural membranes are greatly thickened, in which are tubercles and caseous masses.

Diaphragmatic Pleurisy.—In these instances the diaphragmatic portion of the pleura is involved either partly or chiefly. This is generally a dry pleurisy, but there may be either sero-fibrinous or purulent effusion though rarely large in amount. The symptoms are acute and the pain is situated in the epigastric region. The pain is usually intensified by pressure upon the tenth rib at the point of the insertion of the diaphragm. It is also increased by deep inspiration. Severe dyspnoea is a marked symptom in most cases.

Encysted Pleurisy.—This occurs most frequently in puru-

lent pleurisy and is a form in which adhesions occur so as to produce loculi or spaces which are filled with pus. They are quite difficult to recognize during life.

Interlobular Pleurisy.—The opposed surfaces of two lobes of the lung may become closely agglutinated and sometimes pus is encysted between them. These collections may perforate the bronchi.

Heamorrhagic Pleurisy.—This is characterized by bloody effusion and is met with in asthenic states, however induced, such as cancer, Bright's disease and occasionally in the malignant fevers. Also in tuberculous pleurisy in which event the haemorrhage occurs from the rupture of newly formed vessels. Occasionally it is met with in perfectly healthy individuals. It must not be confounded with blood that has become mixed with the sero-fibrinous exudate caused by wounding a blood vessel during tapping or with haemothorax due to the rupture of an aneurism or the pressure of a tumor on the thoracic veins.

Treatment.—An early treatment and rest in bed with a liquid diet are the measures to be employed at the beginning of the attack. Rarely is there any difficulty in locating the cause of the disturbance; generally a rib or corresponding vertebra is badly subdislocated over the seat of the disease. The sympathetic and phrenic nerves are involved through the intercostals and phrenic nerves. A careful examination of the side of the chest affected should be made as there may be more or less obstruction of the intercostals and the internal mammary arteries from their branching of the aorta and subclavian vessels. A dislocation of the first or second ribs may affect the subclavian vessels and its branches markedly; although all the upper ribs and the thoracic muscles should be examined carefully for derangements which would affect these blood vessels and produce an exudation. Ice-bags upon the chest as in pneumonia may be used.

When the effusion has taken place carefully raising and spreading the ribs with attention to special points of involvement will many times cause absorption of the fluid. The daily amount of liquid food should be greatly lessened with a view of depleting the blood serum from various tissues; thus the serum collecting in the pleura which is a lymph space will also be absorbed. Also working on the bowels, kidneys and skin so that they may be rendered active will aid in the depletion of the blood serum.

It may be necessary in some cases to aspirate especially if other methods fail and if the effusion is large. The points of operation are in the mid-axillary line at the seventh interspace or at the angle of the scapula at the eighth interspace. In puncturing the needle should be held close to the margin of the upper rib so as to avoid the intercostal artery. Withdraw the fluid slowly and if faintness is produced desist. If the exudate reaches as high as the clavicle a litre may be withdrawn safely.

Empyema should be treated surgically. Simply tapping is rarely sufficient. A free incision as in an abscess and thorough drainage should be made. Care must be taken that the drainage tube is large enough.

"In cases of pleurisy the axilla and the inner arm may be tender and painful; this is due to the pleuritic inflammation being carried by the way of the 'nerve of Wrisburg.'

"The pleuritic pain in the costal muscles compels restricted movement of the ribs and also limits the respiratory function of the diaphragm. These painful cramps and stitches are independent of the pain arising alone from the inflamed pleural surface, and the diminution of the respiratory movements is due to a particularly contractured state of the muscles of the chest as it is demonstrated by the fact that the patient can not draw a long breath; hence one may reasonably conclude that nature has so distributed nerves to

the pleura as to enable that serous membrane to control the muscles which create movements of the adjacent costal surfaces and thus insure its quietude during the stages of inflammation or repair" (Ranney).

CHRONIC PLEURISY.

Definition.—Chronic inflammation of the pleural layers. Exudative and dry or plastic pleurisies are the two forms in which this affection occurs.

Chronic Pleurisy with Effusion.—This may follow an acute sero-fibrinous pleurisy and less frequently the disease sets in insidiously. In most cases in children the fluid changes to pus early in the disease. There are cases in which the fluid persists for months without becoming purulent or undergoing any special change. In such cases the character and physical signs do not differ from those in acute sero-fibrinous pleurisy.

Chronic Dry Pleurisy.—These cases originate in two ways: First—This may succeed ordinary pleural effusion when the fluid portion of the exudate is absorbed and the layers of pleura come together; they are only separated by fibrinous elements that become organized into a layer of firm connective tissue. This process goes on at the base, principally, which if it follows the acute form produces but slight flattening but if it succeeds the chronic form or empyema the extent of retraction and flattening will be marked. Calcification may occur in these firm fibrous membranes and occasionally little pouches of fluid are found between the false bands.

Second—A large number of cases are dry from the onset. This condition may follow directly acute plastic pleurisy. It may be of tuberculous origin or it may set in without any acute symptoms. No matter how slight the plastic exudate may be it invariably tends to become organized thus pro-

ducing adhesion of the layers. This is undoubtedly the result when the pleurisy is primary or secondary. The adhesions are generally circumscribed. When the adhesions are of tuberculous origin they may be locally confined to one pleura or they may be bilateral. In these cases both the parietal and costal layers are thickened and embodied in the thickened pleura are found firm fibrin masses and small tubercles.

Occasionally vaso-motor symptoms arise in chronic pleurisy, especially in cases of tuberculous origin and are probably due to the involvement of the first thoracic ganglion at the top of the pleural cavity. Unilateral flushing or sweating of the face or dilatation of the pupil are common manifestations.

Symptoms.—Definite symptoms are rarely present. In some cases the physical signs are quite pronounced while on the other hand they may be entirely negative. In mild cases there may be slight immobility of the affected side with feeble breath sounds. In other cases there may be very full chest expansion while the breath sounds are extremely feeble. In a large number of cases the physical signs are quite distinct. There is displacement of the viscera, retraction of the chest walls, curvature of the spinal column and dropping of the shoulders. There are feeble breathing and creaking leathery friction sounds. Dullness is found at the base.

Treatment.—The treatment of chronic pleurisy is largely that of acute pleurisy. Although gymnastic and methodical breathing exercises should be employed in helping to correct the thoracic walls. Care must be taken not to injure the chest and pleura if adhesions have formed. Surgical work may be necessary in some cases.

The vaso-motor symptoms that are sometimes manifested in chronic pleurisy and are claimed to be due to involve-

ment of the first thoracic ganglion is an interesting feature to the osteopath. Such cases would probably present to the osteopath a marked lesion of one of the upper dorsal vertebrae or the second or third rib. These vaso-motor symptoms are also found in pleurisy associated with tuberculosis of the apex of the lung. This but goes to substantiate the osteopathic theory of pulmonary tuberculosis.

HYDROTHORAX.

Definition.—An accumulation of transuded serum into the pleural sacs.

Etiology.—It occurs as a secondary process in any disease, but Bright's disease and valvular heart disease are common causes. It is frequently met with in connection with general dropsy, however caused, but it may occur alone. In renal diseases hydrothorax is usually bilateral; unilateral in heart affections. The fluid is clear, has an alkaline reaction, low specific gravity, is non inflammatory, without any flocculi or fibrin. The pleural surfaces are smooth. Compression of the thoracic duct, thoracic veins or the superior vena cava by tumor or aneurism are sometimes the causes of hydrothorax. Possibly a downward displacement of the diaphragm would interfere with the thoracic duct as well as lesions in the vertebrae along the dorsal spine.

Symptoms.—Dyspnoea, cyanosis, asthmatic seizures and feeble circulation; while the physical signs are those of the pleural effusion.

Treatment.—The treatment largely depends upon the affection producing the disease. If the serum cannot be absorbed as in the pleuritic treatment aspiration should be undertaken. Do not delay aspiration long when the functions of the lungs and heart are interfered with. By keeping the bowels and kidneys active as in general dropsy will in a few instances give relief.

PNEUMOTHORAX.

Synonyms.—Hydro-pneumothorax; pyo-pneumothorax.

Definition.—Strictly speaking the term pneumothorax means air alone in the thoracic cavity which is an extremely rare condition. It is almost always accompanied by a liquid inflammatory exudate of serum or pus, hence the terms hydro-pneumothorax and pyo-pneumothorax are used.

Etiology.—It may result from: (1) The rupture of the lung in health by a violent strain, or perforation of the pleura, or a phthisical cavity, or a haemorrhagic infarct, or in gangrene and septic broncho-pneumonia. Perforation of the lung from the pleura may occur in empyema. (2) In perforation of the pleura through the diaphragm, due to malignant disease in the abdomen, especially of the stomach, colon, or of the oesophagus. (3) Traumatism as in perforated wounds of the chest or fracture of the ribs.

Morbid Anatomy.—The heart is dislocated toward the opposite side and sometimes there is displacement of the liver and spleen. The lung is compressed. Even when air alone has escaped into the pleural sac a serous or purulent effusion usually soon develops and the membranes are inflamed. It is seldom difficult to find the cause of pneumothorax.

Symptoms.—The onset is usually sudden and ushered in by severe pain, urgent dyspnoea and cyanosis. There may be symptoms of incipient collapse—faintness, weak frequent pulse, lowered temperature, cold extremities and pinched features—in severe cases. The onset, however, may be gradual and there may be no urgent symptoms. Post-mortem examinations have revealed pneumothorax when unsuspected before death.

Physical Signs.—Inspection.—Shows marked bulging of the intercostal spaces of the affected side with immobility. The apex beat is usually displaced. The breathing is frequent and short.

Palpation.—Diminished or abolished vocal fremitus is observed.

Percussion.—The resonance may be tympanitic or even amphoric. Extreme variation depends upon the degree of intrapleural tension. The percussion note may be ringing and amphoric over the upper part of the lung that contains air while there is usually dullness at the base from effused fluid. The extent of these areas can readily be altered by changing the position of the patient. In the upright position the space containing the air is enlarged as contrasted with the recumbent position as the fluid sinks to the base and yields dullness.

Auscultation.—The breath sounds are suppressed. Amphoric breathing or bronchial breathing of a metallic character may be present. The voice has a metallic sound. A characteristic sign is what is called the "coin clinking" sound which is conveyed to the auscultator listening at the back of the chest, while a coin placed on the front of the chest is being struck with another, thus producing a clear metallic sound. Shaking the patient produces a splashing sound when fluid is present (Hippocratic succussion).

Diagnosis.—Usually the history of one or other of the causal factors, together with the characteristic physical signs, coin-sound and succussion splash, the diagnosis will not be difficult. Almost the only affections that pneumothorax could be mistaken for are diaphragmatic hernia following a crush or other action, very large phthisical cavities and dilated stomach.

A Large Phthisical Cavity.—Over the surface of large cavities vocal fremitus is increased or at least remains distinct, the heart is not displaced and the cavities are circumscribed.

Treatment.—Practically most cases should be treated as in ordinary pleurisy with effusion. The various urgent

symptoms that may arise are to be treated symptomatically. When necessary withdraw the fluid with an aspirator. In purulent cases permanent drainage is required.

SECTION VII.

DISEASES OF THE URINARY SYSTEM.

DISEASES OF THE KIDNEYS.

RENAL HYPERAEMIA.

Definition.—An increase in the amount of blood to the vessels of the kidney; it is active hyperaemia when there is arterial congestion, passive hyperaemia when there is venous congestion.

Etiology.—*Active Hyperaemia.*—This may be caused by injuries to the renal splanchnics, injuries over and to the kidneys, exposure to cold when the body is very warm, poisons given as diuretics, eruptive fevers and pregnancy.

Passive Hyperaemia may be caused by obstructive diseases of the general circulation, as chronic heart, lung and liver diseases; or by pressure on the renal veins by tumors, growths and the pregnant uterus. Thrombosis of the renal veins may produce passive hyperaemia, but rarely.

Morbid Anatomy.—*Active Hyperaemia.*—The kidney is swollen and slightly enlarged. Upon removal of the capsule the kidney is found to be brown and mottled. On section the kidney bleeds freely, the Malpighian bodies are distended and microscopical examination shows a cloudy swelling of the renal epithelium.

Passive Hyperaemia.—The kidney is swollen, hard, firm and of a bluish red color. Later there is an overgrowth of connective tissue and some infiltration between the tubules. The Malphigian bodies occasionally become shriveled and the renal epithelium fatty.

Symptoms.—*Active Hyperaemia.*—The urine is scanty, of high specific gravity and of high color, containing some albumin and casts. Pain is experienced over the loins, following the course of the ureters into the testicles, and the bladder is irritable. There is headache, nausea and vomiting.

Passive Hyperaemia.—The symptoms are primarily those caused by the disease producing the disorder. There is

also weight over the loins and dropsy. The urine is diminished, of high specific gravity, highly colored, albuminous and occasionally showing a few hyaline casts.

Prognosis.—*Active Hyperaemia.*—Usually favorable if it can be treated in time.

Passive Hyperaemia.—Depends on the cause. If the disease is prolonged it terminates in interstitial nephritis.

Treatment.—*Active Hyperaemia.*—Absolute rest to the patient and thorough treatment to the renal splanchnics and treatment over the abdomen to the kidneys directly. Water should be drunk liberally and the patient encouraged to use vapor baths. Favorable hygienic surroundings, warmth and good food are indispensable. Warm applications over the loins are helpful.

Passive Hyperaemia.—The treatment largely depends upon the cause, but too much importance can not be given in the treating of the vaso-motor fibres of the kidneys from the eighth dorsal to the first lumbar. Text books state that the vaso-motor fibres to the kidneys are from the tenth to the twelfth dorsal vertebra inclusive, but osteopathic experience shows we can effect vaso-motor fibres slightly higher. Treatment here has a marked effect on the blood pressure within the glomeruli. The renal epithelium is extremely sensitive to circulatory changes. Even the compression of a renal artery for only a few minutes causes serious disturbances. Hence any irritation or obstruction to the vaso-motor innervation of the renal blood vessels may result in serious conditions. The superior cervical ganglion of the sympathetic and the sciatic center have important bearing on the secretions of the kidney, through vaso-motor fibres. Due attention should be paid to the bowels, and the patient required to take plenty of rest and a light diet.

ACUTE PARENCHYMATOUS NEPHRITIS.

Synonyms.—Acute Bright's disease; acute nephritis; acute tubal nephritis; acute diffuse nephritis; acute catarrhal nephritis; acute desquamative nephritis; croupous nephritis; albuminous nephritis; haemorrhagic nephritis; acute albuminuria; acute renal dropsy.

Definition.—An acute inflammatory process affecting the epithelium of the uriniferous tubules and due to the action of cold or toxic agents upon the kidneys, as well as to injuries to the renal splanchnics, characterized by certain nervous symptoms with fever, dropsy, and scanty and high colored urine. This inflammation involves more or less the whole kidney.

Etiology.—This disease is caused by exposure to cold and wet while the body is warm and perspiring. May be caused also by infectious diseases, such as scarlet fever, diphtheria, measles, small pox and others; also by certain specific poisons which are eliminated by the kidneys as turpentine, chlorate of potash, carbolic acid, phosphorus, ginger, cantharides and oil of mustard; also by pregnancy, as this is supposed to compress the renal veins. Blows and injuries to the back at the tenth, eleventh and twelfth dorsals are frequently the cause.

Morbid Anatomy.—At times the kidney alteration may be so slight as not to be recognizable by the naked eye, the appearance varying according to the stage and severity of the disease. The kidneys become enlarged, engorged and of a bright red color, and later have a mottled appearance; and when the capsule which is non-adherent is stripped off the kidney is found to be soft and inelastic. In most of the cases in which the disease is due to toxic agents brought to the kidney through the blood vessels the glomeruli suffer first. The epithelium of the glomeruli and tubules is the seat of cloudy swelling and in the later stages of fatty change

and hyaline degeneration. The tubules are clogged by altered cells, leucocytes and blood corpuscles. In mild cases the interstitial tissue is simply inflamed, but in all cases it becomes more or less mixed with leucocytes and red blood corpuscles.

Symptoms.—The onset is usually sudden, with moderate fever, pain in the back, in the lumbar region and over the kidneys and following the ureters. Nausea and vomiting may be present. Dropsy soon appears beginning with slight swelling or puffiness in the face below the eyes, later showing itself in oedema of the abdominal walls, scrotum and extremities. Uraemic symptoms generally develop. The *urine* is characteristic; is diminished in quantity, of high specific gravity; at first the sediment is copious and reddish brown in color, becoming less in amount and of a higher color. This sediment contains casts of the uriniferous tubules, free blood and epithelial cells, uric acid and urates. There are large quantities of albumin in the urine.

Complications.—Pericarditis, pleuritis, pneumonitis, peritonitis and acute uraemia from retention and decomposition of urea in the blood and from various poisons that are eliminated by the normal kidney.

Diagnosis.—The general symptoms may be very slight, for the most severe cases may manifest slight oedema of the feet, or there may be only the puffiness under the eyes and of the eye-lids. In such cases the diagnosis must depend upon examination of the urine. With previous history, suddenness of the attack and character of the urine ordinarily the diagnosis will be quite easy.

Prognosis.—Although this disease is generally grave, the prognosis is favorable and the majority of cases recover under judicious treatment.

Treatment.—Cases of acute nephritis require rest, quiet and warmth. Many cases recover under these conditions alone. It is absolutely necessary, however, that these conditions be present, no matter what other treatment is used. A thorough treatment in the renal splanchnics cannot be overestimated for it is there (tenth to twelfth dorsals inclusive) that a majority of the lesions occur producing acute nephritis. Besides correcting the vertebral and rib displacements in this region a very effective treatment is to have the patient lie flat upon the back and then the physician, reaching around the patient with the fingers of each hand on either side near the spines of the lower dorsal vertebrae, raises the patient up so that the entire body except the shoulders and the feet are lifted clear of the bed. Thus the treatment springs the spine anteriorly and produces a marked effect upon the kidneys through the renal vasomotor nerves. Occasionally lesions in the upper cervical region interfere with the normal activity of the renal nerve fibres, passing to the kidneys by way of the superior cervical ganglion of the sympathetics.

Another very effectual treatment for the kidneys is treating them through the abdomen, by a careful pressure upon the kidneys through the abdomen on either side of the umbilicus, thus lightly working each kidney outward and upward. This treatment relaxes any tissues about the blood vessels, nerves and lymphatics to and from the kidneys that may be contracted and thus aid in establishing a normal activity of the involved organs. It also helps in relaxing tissues about the ureters and prevents the clogging up of the latter with debris.

The above means have for their object the direct relief of the congestion of the kidney. This is further aided by keeping the bowels active which supplements the action of the kidney, and by increasing the activity of the skin. This

also aids in relieving dropsical effusions. The warm pack, in which the patient is wrapped in a wet sheet and then covered by a number of blankets is an exceedingly good method to relieve the kidneys of some of the work and lessen their congestion, besides arresting uraemic intoxication. This can be repeated daily if necessary. Where there is dropsy and scanty urine the indications are to increase the secreting action of the kidney; besides treatment through the renal splanchnics, which contain the vaso-motor nerves of the kidneys, stimulating treatment to the vagi will help to increase the urinary secretion. Treatment of the liver is important as urea is the natural diuretic. Also injections into the testines of cold water will tend to stimulate the secretion of the kidneys, but this should be used with the greatest of caution; in some cases tepid water would be better (see uraemia).

The diet of the patient with acute nephritis is important. Give food that is easy of digestion and which contains a minimum amount of nitrogen. The stomach is quite likely to be irritable, consequently food that is adapted to it should be selected. Milk and weak animal broths are undoubtedly the best foods. The return to a solid diet, especially of meat, should be very slow. Suitable adjuvants to the milk diet are rice and farinaceous preparations. Alkaline mineral waters are useful to help maintain an alkaline urine, thus tending to withdraw exudates.

For treatment of acute uraemia in Bright's disease see ureamia. Treatment of complications should be treated as affections independent of the renal disorder.

CHRONIC PARENCHYMATOUS NEPHRITIS.

Synonyms.—Chronic desquamative and chronic tubal nephritis; chronic diffused nephritis with exudation.

Definition.—A chronic inflammation of the kidney involving the epithelium, glomeruli and interstitial tissue, charac-

terized by dropsy, increasing anaemia, albuminous urine and acute uraemia.

Etiology.—It may be the result of acute nephritis, but rarely so; for in the vast majority of cases it is primarily chronic, and the etiology cannot always be traced. It may follow the same diseases as already mentioned in the acute form, scarlatina and pregnancy contributing the greater number. It is more common in the male sex and in early adult life, although it is not infrequent in children following scarlatinal nephritis. Habitual exposure to cold and dampness, chronic lesions of the spine, chiefly in the lower dorsal region, alcoholic excesses, tubercular disease of the lungs and frequently malarial poisoning are all causal factors.

Morbid Anatomy.—The large white or a yellowish white kidney is the most common kidney lesion. In this form the kidney is enlarged, often to twice its normal size, and smooth, the capsule being very thin. The tubes on microscopic examination, are found to be choked with broken-down granulated epithelium and fibrinous casts. The capillaries show hyaline changes. The interstitial tissue is increased everywhere, but not to an extreme degree. Catarrhal swelling and hyperaemia (to a slight degree) are found in the pelvis of the kidney.

In the second stage—that of the small white kidney—there is a reduction in the size of the organ, due to the destruction of the renal epithelium and the contraction of the overgrown connective tissue. Some hold that this is a primary independent form and not always preceded by the large white kidney. The organ is pale in color, rough and granular, the capsule being thickened and somewhat adherent. There is an accumulation of fatty epithelium in the convoluted tubules, constituting marked areas of fatty degeneration and giving the organ a white or whitish yellow appearance; it is this which gives the name of small gran-

ular, fatty kidney to this form. There are great interstitial changes, degeneration of tubules and destruction of great numbers of the glomeruli.

Chronic haemorrhagic nephritis is a variety associated with this stage. The organ is enlarged, and scattered throughout the cortex are found brown haemorrhagic foci due to haemorrhages into and about the tubes. Otherwise the changes are similar to those found in the large white kidney.

Symptoms.—It usually begins as a chronic affection and the symptoms slowly become apparent. Failing health and loss of strength, dyspepsia and anaemia, waxy appearance with puffiness of the face, dropsy and increased arterial tension with hypertrophy of the left ventricle, gradually make their appearance. Uraemic symptoms are common while dropsy is marked and persistent. Vomiting and sometimes profuse diarrhoea occur; in fatal cases there is sometimes found to be ulceration of the colon. The urine as a rule, is diminished in quantity, is often very scanty, although it is frequently normal in color and appearance. There is an abundance of albumin, heavy sediment, hyaline and granular tube casts, epithelium from the kidneys and pelvis, leucocytes and often red blood corpuscles. If fatty degeneration takes place there will be fatty casts and oil globules.

Diagnosis.—In the inflammatory stage, where there is enlargement of the kidney, extreme pallor, scanty urine, history of scarlatina, pregnancy, or exposure to cold and wet, and lesions in the lower dorsal region, the diagnosis is clear.

Prognosis.—Always give a guarded prognosis; relapses are frequent, but cases have been cured. There is always a tendency for the sub-chronic forms to become chronic.

Treatment.—The treatment requires persistent work, especially over the renal splanchnics, and strict attention on

the part of the patient to hygienic principles. The quality of the blood should be improved, as it is anaemic and mixed with urea and various effete matters. Thus strict attention should be paid to the diet. Iron is largely used for the anaemic condition by the old practitioners, but this principle we hold to be wrong. It is not more iron that is wanted, but an ability of the system to assimilate the iron which it has. The diet should be carefully selected and of minimum amount. The pure milk diet is undoubtedly the best. The use of meat seems to favor uraemic convulsions.

The digestive organs should be kept in as good a condition as possible, particular attention being paid to the liver and bowels. The use of suitable clothing is important; wool should be worn next to the body. The skin is a powerful adjuvant to the kidney in elimination, and the suppression of the action of the skin throws extra work on the kidneys. Possibly stimulation of the lung function would aid in the elimination. Rest with a proper amount of fresh air and out-door exercise is essential.

In conditions calling for attention to the skin and bowels the treatment will be the same as in acute parenchymatous nephritis. There is a ganglion on each side of the umbilicus within a radius of an inch that sends fibres to the kidneys. Just what is the function of these ganglia I am unable to state. The treatment of the complications is independent of that for the real trouble. For direct treatment to the kidneys see acute Bright's disease.

INTERSTITIAL NEPHRITIS.

Synonyms.—Sclerosis of the kidneys; contracted kidneys; small red kidney; gouty kidney; chronically contracted kidney; renal cirrhosis; cirrhotic kidney; granular kidney; etc.

Definition.—A chronic inflammation of the kidney in which there is reduction in its size due to an extensive destruction of the tubular substance, with an overgrowth

and later a contraction of the connective tissue elements. There is a strong tendency to cardiac hypertrophy with general arterial sclerosis.

Etiology.—This generally arises as a primary condition through lesions to the renal splanchnics, although it may follow paranchymatous nephritis; or it may be caused by a continued passive congestion due to valvular heart disease. Gout, cystitis (often following gonorrhea), the inflammation extending up the ureters to the kidney, heredity, long continued worry, anxiety or grief, chronic alcoholism, syphilis, chronic mineral poisoning, as from lead, and alterations in the renal ganglionic centers are causes. It chiefly occurs in males during middle life.

Morbid Anatomy.—Both kidneys are involved, although one may be more affected than the other, and reduced in size often to less than half their normal size. After removing the capsule which is thickened and adherent the surface is found to be uneven, or granular and containing small cysts. The kidney is hard, tough and resistent, the color varying from a darkish brown to a yellowish gray. The cortical portion is especially reduced in size. On microscopic examination the connective tissue appears greatly increased; this contracts, compressing the tubules and blood vessels, causing their destruction. There is general arterial sclerosis, and the left side of the heart is hypertrophied. There are frequent nasal and retinal haemorrhages, due to the brittleness of the arterial walls which dispose them to rupture; hence apoplexy is a frequent termination. The ganglionic centers, being interfered with, undergo fatty degeneration and atrophy. There are marked retinal changes, retinitis, fatty degeneration of the retinal tissues and sclerosis of the nerve fibre layers.

Symptoms.—The onset is insidious. In most cases the symptoms are latent. The general health is disturbed;

there appear frequent micturition, gastric disturbances, tense and bounding pulse, hypertrophy of the left ventricle, disorders of vision, sleeplessness, headache, furred tongue, slight swelling of the feet, dry skin, scurvy and shortness of breath. The urine is increased in quantity, of acid reaction, light in color, low specific gravity, with a small amount of albumin, a few narrow hyaline casts, and some epithelial cells. There is increased thirst and the patient may have to urinate two or three times during the night. There is well marked mucous cloud, slight sediment, and as the disease advances the urine is diminished, the albumin is increased and the casts become more numerous, while occasionally blood cells will be found.

Diagnosis.—The early stages are not recognizable. Later while there is high arterial tension, thickening of the arterial walls and marked hypertrophy of the heart, the urine should be examined very carefully both night and morning, as the diagnosis will greatly depend upon the condition of the urine; which is increased in quantity, of low specific gravity, with the trace of albumin, narrow hyaline and pale granular casts, making the diagnosis usually easy.

Prognosis.—It is generally incurable, but favorable so far as the power to prolong life is concerned, provided the diagnosis be made early in the case. The case usually terminates with convulsions, coma and death.

Treatment.—The dietetic and hygienic treatment is the same as in chronic parenchymatous nephritis. The nerve and vascular supply to the kidneys should be treated as in acute parenchymatous nephritis. Frequent bathing with friction of the skin should be insisted upon and the bowels kept regular by a treatment of alkaline water. The alkaline water is a good diuretic, besides it flushes the kidneys and helps to remove the debris.

The accidents and complications which so often endanger the patient, must be treated as they arise.

AMYLOID KIDNEYS.

Synonyms.—Lardaceous kidney; waxy kidney; albuminoid disease; depurative disease; chronic Bright's disease.

Definition.—A pathological state of the kidney in which there is a peculiar infiltration into the kidney structure of an albuminoid material of a waxy appearance.

Etiology.—This is simply an event in the process of Bright's disease, but not to be regarded as one of the varieties of Bright's disease. It is most frequently caused by profuse and long continued suppuration, especially of the bones, by syphilis, tuberculosis, cancer, phthisis, lead poisoning and gout.

Morbid Anatomy.—The kidney is large and pale, but it may be normal in size or even small, pale and granular. The capsule is not adherent, the surface of the kidney after removing the capsule is pale and anaemic. On section the cortex is seen to be enlarged. It is homogenous, anaemic, pale, waxy and resisting. On microscopic examination there is found to be an infiltration of a homogeneous or wax-like material. This progresses until all parts of the organ are infiltrated. As the result of this pressure the structures of the kidney undergo an atrophic degeneration, the kidney becomes contracted, smaller, rough and even distorted in shape. The cortex becomes narrowed and the capsule adherent. If a section of an amyloid kidney be stained with a solution of iodine numerous mahogany red points appear.

Symptoms.—This disease almost never occurs alone. There are similar changes in the liver, spleen and often the intestinal canal. There is a profuse watery diarrhoea, due to amyloid changes in the intestinal canal; with loss of flesh and strength, oedema of the lower extremities and

ascites. There is an increased flow of pale, watery urine, of low specific gravity; albumin is abundant and usually hyaline, often fatty or finally granular tube casts occur.

Diagnosis.—The history being associated with a suppurative disease and enlargement of liver and spleen. the character of the urine—polyuria with a large amount of albumin—will determine the condition.

Prognosis.—As a rule the prognosis is decidedly unfavorable and it must be controlled by the suppurating disease with which it is associated.

Treatment.—The primary disease demands attention, otherwise the measures of treatment indicated are exactly those of chronic parenchymatous nephritis with special attention to the general health and surroundings of the patient. Give a generous diet and be persistent with the treatment.

PYELITIS.

Synonyms.—Suppurative nephritis; pyelonephritis; pyonephritis.

Definition.—An acute catarrhal inflammation of the pelvis of the kidney. As a suppurative inflammation extends into the interstitial tissue of the organ, it produces a condition called pyelo-nephritis. The inflammation usually starts in the pelvis of the kidney, the infection being carried there either by the circulation or the urinary tract, but it soon involves the rest of the kidney. It may start from within the organ in the interstitial tissue caused by infectious embolism or traumatism, or the tubules may become obstructed by concretions.

Etiology.—Return decomposed urine due to pressure upon the ureters by tumors or bladder disease; calculus concretion in the substance of the kidney, following pregnancy or infectious fever; traumatic agencies, as falls, blows, kicks or penetrating wounds, and lesions at the tenth,

eleventh and twelfth dorsal and first lumbar vertebrae or slightly lower, will cause pyelitis. But by far the most frequent form of pyelitis is that which follows cystitis, the inflammation extending up the ureters to the pelvis of the kidney and thence to the substance of the organ, inducing pyelonephritis. This disease is rarely idiopathic from exposure to cold and wet.

Morbid Anatomy.—The mucous membrane of the pelvis is usually the first affected, as inflammation generally extending from below upward. It is swollen and sometimes visibly congested and of a gray color. The pelvis and calyces are more or less dilated while the papillae are flattened. There is a gradual dilatation of the calyces and atrophy of the kidney substance, until the whole organ is converted into a pus sac with or without a thin shell of renal tissue. If complete obstruction occurs the fluid portions may be absorbed and the pus become inspissated and cheesy. The ureter is often dilated. In tuberculous pyelitis the apices of the pyramids are also invaded, the kidney substance is broken down and the result is the same, a sac filled with putty-like material impregnated with salts. In the pyelitis caused by cystitis the infection passes up the tubules or is carried by the lymphatics. The abscesses extend along the pyramids, burst through the papillae and calyx into the pelvis of the kidney, and thus also the kidney becomes a purulent sac.

Symptoms.—Pain and tenderness over the region of the kidney first appear. The suppurative stage is marked by high fever and a chill or a succession of chills. The general condition of the patient denotes prolonged suppuration. There is failure of health and more or less wasting with anaemia. The urine is characteristic, contains pus which varies in quantity greatly and where only one kidney is effected may be suppressed for a time and then there will be

a sudden outflow of the pent up pus due to the breaking of the sac. Blood is also very constant but hardly ever of sufficient quantity to be seen by the eye. The urine is usually diminished in quantity and the color pale; the specific gravity is low on account of the small amount of urea present. Reaction of urine is acid. Pus and blood render the urine slightly albuminous. Casts from the kidney and even portions of the kidney may be present.

Diagnosis.—From nephritis by the absence of much albumen tube casts and dropsy.

From cystitis by the history lumbar pains and acid urine. In cystitis the urine is always alkaline.

From perinephritic abscess by the absence of oedema over the lumbar region. The urine may be normal and there are lumbar pains and hectic fever.

From tuberculous pyelitis by history of tuberculosis in other organs and the presence of tubercle in the urine.

Prognosis.—Depends altogether on the cause. In simple cases where there is no obstruction to the flow of pus recovery in the course of ten days follows. If there is obstruction to the ureter the recovery is doubtful. The tuberculous and suppurative varieties are grave.

Treatment.—Depends upon the cause but thorough treatmen along the lower dorsal, the lumbar and sacral regions will be of considerable benefit in controlling the catarrhal process in the kidney, its pelvis the ureter and the bladder.

Negative mineral waters for dilutants and restricting the diet to light food preferably milk is indicated. Rest is important and warm applications locally are sometimes helpful.

The general health must be carefully watched as there is always considerable drain upon the system. A timely operation of nephrotomy may materially lengthen the life of many cases.

URAEMIA.

Definition.—The name applied to a series of manifestations resulting from the retention of poisonous materials in the blood which should have been removed by the kidneys. Uraemic symptoms may occur any time during an attack of nephritis. It may also occur when the circulation of blood in the kidneys is interfered with or the ureters obstructed. It is not alone the urea (which is found to be increased in the blood) but more probably several toxic poisons that are retained in the blood.

Symptoms.—Loss of appetite, nausea, vomiting, headache and drowsiness are the initial symptoms. Headache is usually at the back of the head and may extend down the neck. The next symptom is coma, alternating with convulsions which may range from only a slight twitching to violent epileptiform spasms. These spasms may occur without the slightest warning and are often followed by blindness which may last for several days. These attacks of coma and convulsions are sometimes ascribed to localized oedema of the brain.

Transient paralysis is also due to congestion or oedema of the brain and it may be of the cord also. There may be mania which comes on abruptly, although the delirium is not at all violent, while profound melancholia may be found. There are several nervous symptoms developed such as numbness in the hands and fingers, itching of the skin and cramps in the muscles, especially those of the calves of the legs. Pulmonary symptoms are continuous—dyspnoea, paroxymal dyspnoea and Cheyne-Stokes' breathing. These attacks of dyspnoea may be as distressing as true asthma. Cheyne-Stokes' breathing may be present without coma.

Abdominal Symptoms.—Uncontrollable vomiting may set in with great abruptness followed by hiccough and purging. There may be a catarrhal or diphtheritic inflammation of

the colon with diarrhoea. The breath has a urinous odor and the tongue is often very foul. Pulse is often very slow and full, with a temperature below the normal, although during convulsions the pulse may become rapid and the temperature rising.

Diagnosis.—The history, subnormal temperature, the urinous odor of the breath, high arterial tension and increased second sound of the heart will distinguish the condition.

Prognosis.—Extremely grave, but one should always be very careful in his prognosis, for there is a possibility of recovery even after the most serious symptoms have been manifested.

Treatment.—As impermeability of the kidneys produces uraemia by not allowing the various poisons to be eliminated by the renal path as they should be, the treatment must be applied directly to the kidneys. Elimination is demanded and if treatment through the abdomen to the kidneys directly and to the renal splanchnics does not bring about prompt and thorough elimination of the intoxicating properties the bowels and skin must be operated upon. The vapor or hot-air bath or hot pack should at once be used. An increase in the quantity of urine may be brought about by the displacement of a part of the mass of blood which is in relative stagnation in certain parts of the vascular system, and to throw it into the main circulation in order to increase the pressure within the vessels of the kidney is the work to be done. This great stagnant mass of blood is found in the arterial capillaries of the portal system in the liver and splenic tissues and should be emptied into the circulation in order to increase the arterial tension of the kidneys and thus favor elimination.

The treatment should mainly be applied to the vasomotor nerves of the portal system from the fifth to the ninth dorsals and to direct treatment over the abdomen, liver and

spleen. The introduction of warm water from 110 degrees to 120 degrees into the abdomen by means of injections is useful; warm irrigations increase renal secretion, bowel action and sweating with a decrease of tension. Cold drinks will stimulate the abdominal vessels and induce absorption of a certain quantity of water, to still further increase diuresis. Cold irrigation increases blood pressure temporarily, but later it lessens the pressure; it should be used only with great caution. Milk is one of the best drinks to be used. Secretions of the liver must not accumulate. The bile must be expelled so that its toxicity will not be added to the other poisons.

The food of the patient is an important matter. A milk diet is best; avoid meat and nitrogenous foods and any food that leaves much residue. In this way the nutrition of the patient is kept up with a minimum of urea formation and besides there will be very little intestinal putrefaction.

The employment of the large mucous surfaces of the stomach and intestines as emunctories will be of much aid in a few cases. When the attack is broken the condition resolves itself into the renal disorder, generally acute Bright's disease.

This disease illustrates nicely one phase of the uselessness of drugs. For when the impermeability of the kidney has become such that it ceases to have the power of eliminating toxic substances formed by the organism there is then retained the medicinal substances. The kidney is as impermeable for therapeutic poisons as for the natural poisons and the employment of toxic medicines in such cases has no other effect than to bring about an association of medicinal intoxication with an uraemic.

RENAL CALCULUS.

Synonyms.—Nephro-lithiasis; renal gravel, renal colic.

Definition.—The formation in the kidney of concretions

by the precipitation of the solids of the urine. If large they are called stones; the smaller masses are known as gravel or sand according to their size. When they (stones) attempt to pass through the ureters it brings on an attack of renal colic, rarely are they voided without this symptom.

Etiology.—The affection occurs at all ages. The male sex is more liable than the female. Heredity seems to be a predisposing cause in some families. Inflammation of the pelvis of the kidney caused by derangement of the ribs and vertebrae of the tenth, eleventh and twelfth dorsals or first lumbar is an important etiological factor.

Morbid Anatomy.—The chemical varieties are (1) *uric acid*, which is the most important. The stones are usually smooth or lobulated; are hard and of a reddish color. Usually in these stones, both uric acid and urates are to be found. This material may be passed in the form of sand or large stones. The sediment in the urine may be the nuclei of the stones; also, foreign matters such as the mucus or desquamated epithelium, caused by the inflammation in the pelvis of the kidney, blood clots, or in fact any foreign matter that may reach the urinary passages.

(2) *Oxalate of Lime.*—These stones are a mixture of an oxalate of lime and uric acid. They are dark in color, very hard and uneven, with hard pointed projections. On account of their uneven shape they have been named mulberry calculi. These stones produce great pain as they pass through the ureters.

(3) *Phosphatic Calculi.*—These are white in color, soft and mortar-like. They are not very common and are composed of phosphate of lime, ammonia and magnesium phosphate.

Rare forms are made up of xanthine cystin and carbonate of lime.

The dendritic form of calculus (coral calculi) is a calculus

that occupies the pelvis itself and which may form moulds of the infundibula and calices.

Symptoms.—There is pain in the back in the region of the kidneys with more or less tenderness. The pain may be severe and paroxysmal. There may be bleeding which is seldom profuse; this will give the urine a smoky hue but may be present to such a small degree as to be only apparent by the use of the microscope. Pus is almost always present. The stone may obstruct the ureter and cause pyonephrosis or hydro-nephrosis. It may also excite pyelitis.

Renal Colic.—There is a sudden onset and great pain which starts in the back radiating downward into the groin, down the side of the thigh and into the testicle and glans-penis. The testicle is often retracted, the face pale, and the features pinched. There are cold sweats and the pulse is weak. The paroxysm may last only a few minutes or extend over several hours. After an attack the urine is characteristic, blood and pus are always present and sometimes mucous casts. If uric acid is found it points to uric acid or oxalate of lime calculi and the urine is acid in reaction. If alkaline phosphatic stones may be suspected, examination of the urine directly after the attack aids greatly in diagnosis, for at other times the urine is usually negative.

Diagnosis.—*Biliary Colic.*—The jaundice in biliary colic comes on very soon after the obstruction begins. The stools are without bile and the pain extends from the right hypochondriac region to the upper abdomen and the right shoulder. The urine is negative and a stone may be passed in the stools.

Renal colic is often simulated when the ureter is obstructed from any cause whatever. It may be compressed from a floating kidney or tumor, or obstructed by a clot of blood, fragments of hydatid cysts or plugs of mucus.

Prognosis.—As complications may arise it is best to give a guarded prognosis but the prognosis is generally quite favorable. It is a disease that is very apt to recur. If the stone is large its passage along the ureter may prove fatal, but if it is renal sand it may be easily voided in the urine and thus the prognosis will be much more favorable.

Treatment.—A treatment should be given to try and overcome the causes producing the calculi. Treat the kidneys thoroughly both through the renal splanchnics and directly through the abdomen, anteriorly. Treatment here corrects disorders that seem to release some solvent that acts upon the various forms of calculi and disintegrate the ones already formed and prevents the formation of others. Possibly this solvent is an internal secretion of some gland; like the splenic secretion is to biliary calculi.

In the uric acid tendency the free use of alkaline mineral waters for the solution of uric acid may in many cases be helpful. Much may be done by dieting. The amount of nitrogenous food should be limited, using a minimum amount of meat and eating freely of milk and vegetables.

In the phosphatic tendency diluted drinks freely used are helpful. Meats are indicated. Milk and vegetables should not be used freely as they tend to alkalize the urine.

During an attack of *renal colic* when a stone has lodged in a ureter one may be able by manipulation to aid the stone in its progress downward somewhat after the manner of manipulating gall-stones. By inhibiting the nerve force of the spinal nerves along the lumbar and sacral regions (chiefly tenth dorsal and first lumbar) relief may be given the sufferer. The nerves of the ureters are derived from the inferior mesenteric. spermatic and pelvic plexuses. Great relief is experienced by the hot bath, and it is sometimes sufficient to relax the spastic condition. Clothes wrung out of hot water and applied locally are of aid. Occasionally a change

of posture will give relief. Even inversion of the patient is sometimes followed by immediate cessation of the pain. The patient may drink freely of hot lemonade or water. An anaesthetic may be of aid in the manipulation of a renal calculus in the ureter, as the anaesthetic will relax the tissues over the abdomen, making it much easier for one to get near the impacted calculus. During the intervals the patient should lead a quiet life and avoid sudden exertions of any kind. It is important to keep the urine abundant, consequently have the patient drink a large quantity of distilled water.

MOVABLE KIDNEY.

Synonyms.—Floating kidney; wandering kidney; ectopia renis; palpable kidney; nephroptosis; ren mobilis.

Definition.—A distinctly mobile condition of the kidney almost always acquired, but may be congenital, due to the lax condition of the tissues which surround it and to the elongation of the renal vessels which allow the kidney to move in certain directions. There are very different degrees of mobility in different cases. It may be so slight as hardly to be recognized or so great that it can easily be felt by the hand through the abdominal walls, resembling a movable tumor in the abdomen.

Etiology.—A movable kidney is most common in women of middle life. It is most likely a congenital, relaxed condition of the tissues around the kidney; and probably this looseness is increased by the following conditions—muscular exertion, repeated pregnancy, mechanical violence, as a fall or tight lacing, or depression of tumors growing in the neighborhood of the kidneys. In nearly all cases a slight anterior or posterior and weakened spine is found in the dorso-lumbar region.

Symptoms.—Often there are no noticeable symptoms. Sometimes when the displacement and mobility of the kid-

ney is most marked the reflex symptoms are not noticeable. The right kidney is the one usually affected on account of its relation to the liver, which moves during the respiratory act. Usually there is pain in the lumbar region, and the patient experiences a heavy dragging pain in the abdomen, which especially manifests itself while standing and walking. There may be intercostal neuralgia. There may be obstinate indigestion of every grade, palpitation of the heart, flatulence and cardialgia; also, an irritable bladder due to pressure. At times the kidney becomes tender and swollen as a result of twisting of the renal vessels, causing engorgement of the organ; this may be associated with agonizing pain and symptoms of collapse.

Diagnosis.—The shape being reniform, mobility marked, stationary, and lessened resistance on percussion of the renal region will make the diagnosis sure.

Prognosis.—Very rarely proves fatal.

Treatment.—Many cases rarely give any trouble. Attention to the general health of the patient and persistent treatment in the dorso-lumbar region will prove of considerable value in a number of cases by strengthening the relaxed tissues about the kidneys. The use of supports are not satisfactory in a great many cases. Treatment for fixing the kidney—nephrorrhaphy—is of permanent value.

To determine the presence of a movable kidney it is best to have the patient in the dorsal position, the head slightly lowered and the abdominal walls relaxed by flexing the thighs moderately upon the abdomen. Then with the left hand in the lumbar region behind the eleventh and twelfth ribs, and the right hand in the hypochondriac region, the kidney can usually be detected; or have the patient in a standing posture with body bent forward slightly, with hands placed upon a table, perform bimanual palpation; or perform the manipulation in the knee-elbow position. When

in this position (knee-elbow) if the kidney has become dislodged a resonant note will be obtained by percussion over the normal location of the kidney.

DISEASES OF THE BLADDER.

CYSTITIS.

Synonyms.—Catarrh of the bladder; vesical catarrh.

Definition.—An inflammation of the mucous membrane of the bladder.

Etiology.—The retention of the urine, foreign bodies in the bladder such as stones, the use of dirty catheters, exposure to wet and cold, injuries to the bladder and over the pubes, irritations to the sacral nerves, lesions in the dorsal enlargement of the cord, irritating drugs, enlarged prostate and urethral strictures are the principal causes of cystitis. The disease may be secondary to fevers, infectious diseases and inflammation of adjacent organs. A displaced uterus may produce a chronic irritation of the bladder.

Morbid Anatomy.—There is hyperaemia of the mucous membrane of part or of the whole of the bladder, with redness, congestion and oedema. The secretion of mucus that covers the mucous membrane is of a dirty gray color. If the congestion is very extensive a bursting of the capillaries may take place. In a few cases the neck of the bladder and the ureter where it passes through the prostate is involved.

In chronic cases the mucous membrane becomes thickened and covered with patches of false membrane. The muscular wall of the bladder becomes hypertrophied and the veins tortuous.

Symptoms.—The onset may be sudden by rigors and fever, but in many cases a frequent desire to micturate will be the first symptom. This is followed by tenderness and

pain over the bladder and contiguous parts, loss of appetite, depression and sleeplessness. Tenesmus of the bladder caused by spastic conditions of its muscles and a burning along the urethra are usually present. The urine is alkaline in reaction and contains pus, epithelium and blood.

Diagnosis.—The diagnosis is usually easy. Pyelitis has pains in the lumbar region and along the ureters and there is a frequent desire to urinate. The bladder is not subject to spasms and besides the urine is of an acid or neutral reaction.

Prognosis.—In acute cases the prognosis is usually favorable, but in cases of long standing and in hypertrophy of the bladder prognosis must be guarded.

Treatment.—Rest in bed with strict attention to diet is necessary. Milk is the best food and avoid highly seasoned articles. The use of plenty of pure water is helpful to dilute the urine and if necessary the bladder should be washed out carefully. If the case is severe emptying the bladder several times a day with a catheter will be necessary. Always be careful about the cleansing of the instruments. Warm applications over the pelvic region will be comforting to the patient if the inflammation is severe.

Treatment of the second, third and fourth sacral nerves controls the neck of the bladder. The fundus of the organ is supplied by sympathetic fibres from the pelvic plexus. Direct treatment over the bladder if applied carefully will act on the terminal fibres of the sympathetic. Lesions to the nerves of the sphincter of the bladder oftentimes occurs between the fifth lumbar and sacral. Such lesions are apt to be found in cases of *incontinence* of urine. The lesion is usually a lateral one.

Thorough treatment to the genital urinary center (lower dorsal and upper lumbar) will be of much aid in controlling the inflammation in cystitis. In males direct treatment of

the prostate glands is occasionally important and also of the plexus of nerves at the trigone of the bladder. In treating the prostrate gland introduce a finger into the rectum and work about the base of the gland to relax the tissues; and thus remove obstructions of the vascular, lymphatic and nervous structures to the gland. Do not work much upon the gland itself, it simply irritates the gland. Also treat the innervation at the eleventh and twelfth dorsal, fifth lumbar, and first, second and third sacrals.

It is important in young children to examine the condition of the penis in bladder diseases. The prepuce may become adherent or other irritations may be found that are a source of disturbance to the bladder or even to the kidneys on account of the intimate connection of the sympathetic system in this region and the relation of one organ to another.

SECTION VIII.

DISEASES OF THE CIRCULATORY SYSTEM.

DISEASES OF THE PERICARDIUM.

PERICARDITIS.

Definition.—An inflammation of the serous membrane covering the heart and its reflection in front over the chest wall.

Etiology.—Primary inflammation of the pericardium is rare. Such cases usually result from cold and exposure or injury and is most commonly met with in children.

Secondary pericarditis occurs in connection with rheumatism, Bright's disease, tuberculosis, gout, diabetes, eruptive fevers, various septic properties and dyscrasia. Pericarditis may result by extension of inflammation from contiguous organs; as the disease may occur in pneumonia, pleuro-pneumonia, chronic valvular diseases, and ulcerative diseases of the oesophagus, bronchi, vertebrae, ribs, stomach, etc. Also displacements of the ribs, over the heart and involvement of the corresponding vertebrae may result in pericarditis. The disease may occur at any age. Males are more frequently attacked than females.

Morbid Anatomy.—The morbid conditions vary with the stages. The stages are (1) acute, plastic or dry pericarditis; (2) pericarditis with effusion, sero-fibrinous, haemorrhagic or purulent; (3) absorption or adhesive pericarditis.

The changes are the same as in various sero-membranes. Hyperaemia and alteration of the epithelium which is most marked on the visceral layer; this is followed by an exudation from the hyperaemic vessels. There is roughening and loosening of the epithelium and the fibrin is precipitated upon the walls of the pericardium. More or less lymph is exuded and sometimes injected capillaries burst and cause a bloody exudation. From this stage the morbid appearances vary according to the progress of the disease. The disease may undergo resolution and fatty degeneration

and absorption of the products in point take place. As the stage of effusion occurs the parietal and visceral layers of the pericardium are separated by a sero-fibrinous exudate. This condition may increase until the quantity of the exudate is considerable, or the effusion may become absorbed. Rarely does the exudate become purulent.

Adhesions may occur between the layers of the pericardium during the last stage by bands of various length or the layers are more or less separable.

Symptoms.—Simple cases may not present any symptoms. Usually a chill or cold feeling at the heart followed by pains in the cardiac region ushers in an attack. Fever is generally present, it rarely exceeds 102.5 degrees F. Tenderness over the heart is noticeable. There is dyspnoea and the patient is restless.

In the effusive stage the symptoms depend largely upon the amount of diffusion. The pain is sharp and stitch like. Nausea, vomiting and hiccough sometimes occur. The pulse is irregular and feeble. Insomnia, headache and even delirium may occur. Distention of the veins of the neck may cause dysphagia and a cough may be present owing to the irritation of the trachea. The recurrent laryngeal nerve may be compressed as it winds about the aorta and thus cause aphonia.

The friction sound is a characteristic physical sign of the first stage. In the effusive stage there may be precordial bulging. The area of dullness is enlarged, the diaphragm and liver may be crowded downward, causing an epigastric bulging. As the effusion increases the heart sounds becomes less distinct. The friction sound is not heard. In the third stage there is a return to normal, although adhesions may form and cause precordial retraction and permanently embarrass the heart's movements.

Diagnosis.—Pericarditis is frequently overlooked by the practitioner. It is a serious disease and one should be especially careful. In cases of rheumatism the physician must always be on his guard. The greatest difficulty lies in distinguishing between dilatation and cardiac hypertrophy and pericardial effusion. Hydro-pericardium may be mistaken for pericardial effusion.

To distinguish between endocarditis and pericarditis should not be a difficult task if one understands thoroughly the nature of each disease. A large pericardial effusion may be confounded with a pleural effusion.

Prognosis.—In mild cases of pericarditis the large majority rapidly recover from two to three weeks. In cachectic subjects and where adhesions have formed the duration is longer. Relapses may occur. The purulent effusions are the most dangerous. Septic cases are usually fatal.

Treatment.—Demands prompt and effective measures. Absolute rest, mentally and physically, is necessary. Too much stress cannot be laid upon this point, as death has occurred from neglect of this. To quiet the heart's action is the first necessary requisite, and then give treatment to limit the inflammation. In the second stage prevent cardiac failure and promote absorption are the indications to be met.

Raising and separating the ribs over the heart will be of great aid in lessening the inflammation and promoting absorption. In many cases lesions to the ribs on the left side and subdislocations of the vertebrae affecting the vasomotor nerves, the lymphatics and nerves to the heart will be found. The first five ribs and corresponding vertebrae is the region where one may expect to find the lesions. An additional help besides absolute rest in slowing the heart's action will be a stimulating treatment in the dorsal region between the scapulae. Correcting any lesion that may be found to the vagi nerves will also be a help in controlling

the heart's action; besides most of the vaso-motor fibers to the heart are in the vagi. These lesions are usually found at the atlas. One should also examine carefully the cervical vertebrae for derangements that might affect the cervical sympathetic, especially the superior and middle cervical ganglia. These ganglia are primarily affected from the fifth cervical to the first dorsal. Inhibition for a few minutes between the transverse process of the atlas and the occipital bone to the posterior occipital nerves will be of great aid in controlling the tumultuous action of the heart.

The function of the phrenic nerve must be borne in mind when regarding the pericardium. The phrenic is usually primarily affected at the third, fourth and fifth cervicals, and occasionally there are connecting fibers as low as the fourth and fifth dorsals. Ice-bags may be found of value in retarding the progress of the effusion and in lessening the heart's action. Liquid food, as milk and broths, should be given throughout the disease. If the effusion is very large the service of a surgeon should be secured and tapping performed. If the effusion is of a purulent nature a free incision should be made with antiseptic precautions.

ENDOCARDITIS.

Definition.—Inflammation of the lining membrane of the heart. The process is usually confined to the valves; the lining of the cavity of the heart may also be affected, especially in severe cases.

Varieties.—Simple acute endocarditis; ulcerative endocarditis; chronic endocarditis.

SIMPLE ENDOCARDITIS.

Etiology.—This form usually results from acute articular rheumatism. It may also be caused by the infectious diseases, especially scarlet fever; but rare, in typhoid fever,

measles, chicken pox, diphtheria, small pox and erysipelas. Acute endocarditis is most frequently found in chorea. It is also met with in diseases attended with emaciation and general weakness, as cancer, gout, Bright's disease and diabetes. It is not uncommon in phthisis.

Morbid Anatomy.—The left side of the heart is most commonly involved. The disease is characterized by the presence of small vegetations on the segments or on the lining membrane of the chambers varying in size from 1 to 4 mm.

The mitral valves are more often affected than the aortic. The vegetations appear usually on the auricular surface of the mitral and the ventricular surface of the aortic valves a little back of the valve edge. Their seat corresponds to the point of maximum contact (Sibson). These growths are liable to be broken off at any time and carried as emboli by the blood current to distant organs, particularly the brain, spleen and kidneys. This is not uncommon in acute endocarditis, engrafted or chronic valvulitis. In favorable cases the vegetation is ultimately absorbed and the valve is but slightly altered beyond a simple sclerotic thickening. This is often the starting point of sclerotic valvulitis.

During the foetal life the right side of the heart is most commonly involved. The chorda tendinae are sometimes affected but rarely alone.

The vegetations are composed of proliferated connective tissue cells. The superficial elements undergo a coagulation-necrosis and there is deposited fibrin from the blood. Micro-organisms are found and are probably the specific agent in causing acute endocarditis.

Symptoms.—A large number of cases are latent, the autopsy first disclosing the lesion. In many cases there is slight fever, a frequent sometimes irregular pulse, palpitation and dyspnoea. There is seldom any pain.

Physical Signs.—These are very uncertain. They may

not be present in mild cases and in those in which the valves are not affected. Usually auscultation furnishes the only indication of endocarditis—a soft blowing, systolic murmur which is heard most frequently at the apex, as the mitral valves are the ones generally involved. When the aortic valves are affected the murmur is heard at the second interspace at the right edge of the sternum.

Diagnosis.—This depends entirely upon the etiology and physical signs.

Treatment.—The patient should be kept as quiet as possible so that the work required of the heart may be reduced to a minimum. The disturbed circulation can be controlled by careful attention to the vaso motor nerves at the various centers along the spine. Attention should be given the disease that is causing the endocarditis. Keep the patient well protected by flannels and beware of damp rooms and sudden changes of temperature.

A local treatment should be given to correct any lesion that may be found to the upper five dorsal vetebrae or ribs, and to raise and spread all of these ribs so that the heart's action will not be unduly disturbed by interferences with its innervation. The vaso-motor nerves to the heart's vessels are found in the vagi nerves, consequently care should be taken that lesions do not exist to these nerves. An inhibitory treatment to the sub-occipital nerves acts reflexly on the vaso-motor nerves and tends to equalize the general vascular system; this treatment quiets the heart's action. Ice applied locally is warmly advocated by many practitioners. Flannels should be placed next the skin and the ice-bag placed over the flannel. This reduces the fever, lessens the pulse rate and quiets the heart action. The same points are obtained by the inhibitory treatment at the sub-occipital region. The ice-bag also relieves pain and oppression. Be very careful in the use of ice when there is much cardiac di-

latation. Treatment of the middle and inferior cervical region may have some effect in controlling the heart's action. The patient should have nourishing liquid food.

ULCERATIVE ENDOCARDITIS.

Synonyms.—Malignant, infectious or diphtheritic endocarditis.

Definition.—Malignant endocarditis is an acute infectious, or septic disease; characterized locally by necrosis or ulceration of the valve. It may be a primary disease, or a secondary affection in septicemia, pneumonia, erysipelas, scarlet fever and acute rheumatism.

Etiology.—It is doubtful if there can be a primary form of malignant endocarditis. Chronic valvular defects are the most important predisposing causes. Pneumonia is most frequently, of all the acute diseases, associated with severe endocarditis. It is rare in tuberculosis, diphtheria, typhoid fever and chorea. It occurs in association with erysipelas, gonorrhoea and rheumatism. Septicemia (from whatever cause) pleurisy, meningitis and puerperal fever are causes of ulcerative endocarditis.

Morbid Anatomy.—The lesions are either vegetative, ulcerative or suppurative. The vegetations are composed of granulation tissue, granular and fibriallated fibrin, and colonies of micro-organisms. They become necrotic and break down into lucers. The ulcerative changes may lead to perforations or produce valvular aneurisms. Of the valves the mitral is the most frequently affected; then the aortic; then the mitral and the aortic together; then the heart walls; then the tricuspid; then the pulmonary. In a few cases the right heart alone is involved. The lesion is not always confined to the valves, but may involve the mural endocardium.

The most common organisms found are the streptococci and staphylococci. The bacillus diphtheriae, bacillus coli,

gonococcus, pneumococcus, bacillus anthracis and other organisms have been found.

Associated pathological changes include the lesions of the primary disease and the changes due to embolism. The spleen, kidneys, brain, intestines and skin may be the seat of embolism. When found in the lungs they originate in the right heart.

They form suppurative infarcts which may present the ordinary red or white color.

Symptoms.—If in the course of any of the diseases previously named under etiology, chills followed by fever and sweats occur, ulcerative endocarditis should at once be suspected and a thorough examination be made.

General Symptoms.—High irregular fever, delirium, sweating, great prostration, rapid pulse, hurried breathing and sometimes jaundice and diarrhoea occurs.

Embolic Symptoms.—The occurrence of delirium, coma or hemiplegia point to involvement of the brain; pain in the region of the spleen with increased dullness on percussion point to trouble in that organ; haematuria may occur from involvement of the kidneys. More rarely there will be impaired vision from retinal haemorrhage; and there may be suppuration and sometimes gangrene in various locations depending upon the position of the embolism.

The special types of the disease are:

The *septic type* is seen in connection with external wounds, the puerperal process or acute necrosis. The symptoms presented are rigors, irregular fever, sweats and exhaustion—the signs of septic infection. The symptoms may resemble a quotidian or a tertian ague.

The *typhoid type* is the most common. The characteristic symptoms are irregular temperature, sweating, prostration, delirium, drowsiness, diarrhoea, petechial and other rashes, distention of the abdomen and pain in the right iliac region.

The heart symptoms may be entirely overlooked as in the septic type.

The *cardiac type* are considered those cases in which there has been chronic valvular diseases which are attacked with fever, rigors and sweats, and the symptoms of embolism may develop.

In the *cerebral group* of cases the symptoms may simulate meningitis, basilar or cerebro-spinal; there may be acute delirium as the distinctive symptom.

Physical Signs.—The heart symptoms may be entirely latent. Even after a careful examination there may be no murmur present. When murmurs are present it is often difficult to locate them.

Diagnosis.—The previous history should be considered and this, togegether with the symptoms, makes a correct diagnosis possible, even though physical signs are absent.

Prognosis.—The duration is from a few days to several weeks. The termination is usually fatal.

Treatment.—The treatment of this form of endocarditis is likely to be of little avail. About the same treatment as in simple endocarditis should be followed. Absolute rest is essential and this, coupled with the local treatment of simple endocarditis and a nourishing liquid diet constitutes the principal treatment.

CHRONIC ENDOCARDITIS.

This condition may begin as a chronic inflammation or follow the acute form which is more often the case, especially the rheumatic form.

Etiology.—Heavy muscular labor, strains to the upper dorsal vertebrae and ribs, arterial sclerosis, Bright's disease and certain poisons such as syphilis, gout, alcohol and lead are causes of chronic endocarditis. A large number of cases follow acute rheumatic endocarditis.

Morbid Anatomy.—In the early stages the edge of the valve is slightly thickened, as the sclerotic changes increase the fibrous tissue contracts producing thickening and deformity of the segment. The edges become round and curled. Extensive union of the segments along the free margins may take place interfering with complete opening and closure. In the mitral valves these adhesions may reduce the aperture to a mere buttonhole-slip the button hole mitral orifice. In the sclerotic and necrotic tissues lime salts are deposited producing in extreme cases firm bony rings, diminishing greatly the mobility of the valve. Fatty degeneration leading to the formation of necrotic ulcers is common.

In chronic mural endocarditis the lesions found are cicatricial like patches of a grayish white color, usually invading the underlying muscular structure to a greater or less extent.

It often occurs in association with myocarditis.

AORTIC INCOMPETENCY.

The failure of the aortic valves to prevent a return of blood to the ventricles either from dilatation of the orifice or of more frequently from diseases of the segments themselves.

The chief *causes* are contraction of the segments following inflammation; rupture; dilatation of the orifice; hypertrophy of the left ventricle; congenital malformations.. In a number of cases of aortic incompetency the lower ribs will be found dislocated obliquely downward. It is claimed that when these ribs are dislocated downward the diaphragm is interfered with; that it is more or less prolapsed and thus causes a constriction of the aorta. Such a condition would produce an aortic regurgitation to a greater or less extent which might result in dilatation of the orifice if the pressure was great.

The *symptoms* of aortic incompetency are: The area of cardiac dullness is increased; the apex beat is in the sixth or seventh interspace, possibly as far as the anterior axillary line; there is sometimes a precordial bulging; a shot-like pulse is present, pulsation of the arteries is visible; a diastolic murmur is heard at the second right intercostal space; and the apex beat which is forceable is located downward to the right.

AORTIC STENOSIS.

This is a narrowing of the aortic orifice. It may occur with aortic incompetency.

In this disease there is usually a stiffening of the aortic leaflets or there may be a fusion or a thickening of the segments. The condition may be congenital but it is generally due to inflammation chiefly from rheumatism. When it occurs in older people there is likely to be a calcareous deposit causing the disturbance. There is a liability of mitral regurgitation following aortic incompetency and stenosis.

The symptoms of aortic stenosis are: A systolic murmur is heard at the second right intercostal space, the murmur is propagated to both carotids; the pulse is small and regular; the area of cardiac dullness is to the left and when the heart beat is strong it is downward and to the left.

MITRAL INCOMPETENCY.

In mitral incompetency the mitral valve does not close properly on account of rupture and contraction of the mitral leaflets, dilatation of the left ventricle, and diseases of the chorda tendinae.

The principal *causes* are congenital defects; muscular strain; fevers; impaired states of the blood as from rheumatism, Bright's disease, alcoholism, etc.; aortic valvular disease and diseases of the chorda tendinae. In this disease lesions are oftentimes found in the upper dorsal vertebrae

and corresponding ribs, especially the first rib. Following this disease, as well as mitral stenosis is a liability of tricuspid incompetency and stenosis.

The *symptoms* of mitral incompetency are venous engorgement; dyspnoea; cough; the apex beat is to the left; a blowing sound is heard best at the apex and occurs with the first sound of the heart.

MITRAL STENOSIS.

This is a constriction of the left auriculo-ventricular orifice, so that the blood is restrained from passing freely into the left ventricle.

The *causes* are valvular endocarditis from various diseases, causing thickening, constriction and adhesion of the segments of the mitral valve. The left auricle may be so greatly dilated and hypertrophied as to cause tricuspid regurgitation.

The *symptoms* are dyspnoea; serous expectoration; pulsation of the jugular vein; a presystolic thrill is discerned upon palpation near the apex; the radial pulse is small, compressible and irregular; there is an increase of heart dullness to the right; a prolonged, rough presystolic murmur of a churning or rolling nature is heard just above and to the left of the apex; and in right ventricular hpertrophy the pulmonic second sound is increased.

TRICUSPID INCOMPETENCY.

Tricuspid incompetency is due to an imperfect closure of th tricuspid valves.

The *causes* are inflammation of the endocardium causing puckering or shortening of the valve columns; diseases of the lungs; diseases of the left side of the heart; dilatation of the right ventricle. Lesions are oftentimes found in the region of the second and third ribs on the left side, and corresponding dorsal vertebrae.

The *symptoms* are enlargement of the heart toward the right edge of the sternum; the apex beat is forward toward the ensiform cartilage and epigastrium; a soft, blowing, systolic murmur, heard best, over the ensiform cartilage; pulsation of the jugular vein. If the case is far advanced pulsation of the liver may occur.

TRICUSPID STENOSIS.

Constriction of the right auriculo-ventricular opening so that the flow of blood through it is impeded.

This disease is of rare occurrence. It may be congenital or acquired. It may result from endocarditis, caused by rheumatism, diseases of the left side of the heart, and from congenital defects. As in mitral stenosis there is thickening, adhesion and constriction.

The *symptoms* are: The dullness is increased to the right side of the sternum; a presystolic murmur over the root of the ensiform cartilage or slightly to the right; cyanosis of the face.

PULMONARY INCOMPETENCY.

This is a rare lesion that causes a regurgitation of blood into the right ventricle.

It is usually congenital or it may be the result of malignant endocarditis. This lesion causes hypertrophy and dilatation of the right ventricle.

The *symptoms* are: The apex beat is displaced to the left; a diastolic murmur heard best at the left second interspace; and in some cases a tricuspid murmur may be heard due to dilatation.

PULMONARY STENOSIS.

This condition is extremely rare. It is a constriction of the pulmonary valves impeding the blood flow from the right ventricle.

This valvular lesion is usually congenital. It may also be due to, endocarditis, myocarditis and atheromatous change.

The *symptoms* are enlargement of the right ventricle to the right of the sternum; a systolic murmur heard best at the left second interspace; weak pulse; cyanosis; dyspnoea; clubbed fingers; cold extremities.

Prognosis of Chronic Endocarditis.—It is almost impossible to give any positive statement as to the prognosis of chronic endocarditis. There are many causes that produce the disease and many circumstances that may arise to change its course. A large number of cases have come to the A. T. Still Infirmary for treatment after some of the most eminent physicians have pronounced their case hopeless, and after a few weeks' treatment have been entirely cured. Naturally the question arises, why have our foremost physicians made such a mistake? Only one answer is possible and that is they do not realize the significance of anatomically deranged tissues affecting nerve fibres and vascular channels. We are certainly a step in advance of our medical brethern in diagnosis.

If the patient takes care of himself and leads a quiet life compensation may be maintained for many years. The prognosis must be based largely upon the symptoms presented in each case. Dropsy and dyspnoea are two prominent symptoms that indicate a failing compensation.

Treatment of Endocarditis.—In chronic endocarditis almost invariably lesions are found to the upper five dorsal vertebrae, or the upper five ribs or clavicle on the left side. Many severe valvular diseases have been cured by correcting lesions in this region. Dislocation of the first rib may interfere directly with the subclavian artery and thus cause constriction of the artery and a consequent regurgitation; also, cardiac fibres of the recurrent laryngeal nerve may be im-

pinged by dislocations of this rib. Many lesions occur at the second and third ribs which interfere with the right side of the heart; and lesions of the third, fourth and fifth ribs may interfere with the mitral and aortic valves. Lesions of the corresponding dorsal vertebrae produce the same lesions as the ribs. These lesions must be to the sympathetic nerves along the dorsal region, but as to the details of the disorder I am unable to give information. Lesions may be found anywhere along the cervical vertebrae which may involve inhibitory (vagi) fibres or accellerator (sympathetic) fibres to the heart. Also, in some cases the floating ribs are dislocated downward and cause a prolapsus of the diaphragm and thus constriction of the aorta which may result in regurgitation and valvular difficulty. Little is known of the osteopathic principles in cases of vertebral and rib dislocations affecting the heart; although many cases of various diseases of the heart have been cured by correcting these anatomical derangements. Very likely the chief affect is a reflex one upon the nerves to the heart. In a few cases pressure is brought to bear upon the blood vessels and nerves directly.

Another point to be considered in the treatment of chronic endocarditis is to maintain compensation in all cases if possible. The correction of the lesions found in the vertebrae and ribs will cure only such cases that are functionally disturbed whether of the heart as a whole or of some portion of the heart or of a valve. Of course it is impossible to overcome structurally changed valves. Hence in such cases it is the compensation that must be maintained, and this is to be done by watching the arterial, venous and capillary systems carefully. When compensation is complete keep the excretory organs active, and careful exercise and a nutritious diet will be all that is necessary. Attention to diet is im-

portant in all cases of heart trouble on account of the sympathy between the stomach and the heart.

DISEASES OF THE HEART.

HYPERTROPHY OF THE HEART.

Definition.—An enlargement of the heart due to an increase in the muscular tissue which form the walls of the heart.

Three forms are recognized (1) simple hypertrophy when the muscular walls are thickened while the cavities remain of normal size; (2) eccentric hypertrophy where the walls are thickened and the cavities are dilated; (3) concentric hypertrophy in which the walls are thickened while the cavities are diminished in size.

Etiology.—Valvular diseases of the heart causing an obstruction to the outflow of blood as mitral insufficiency; discases of the aortic valve; increased intra-vascular pressure caused by sclerotic changes in the walls of the vessels; contraction of smaller arteries due to irritation of toxic substances in the blood, as in Bright's disease. Over-eating or drinking and excessive physical exercise would especially influence the cause of hypertrophy of the left ventricle.

Hypertrophy of the right ventricle is caused by valvular lesions on the right side. Lesions of the mitral valve causing an increased resistance in the pulmonary vessels. Diseases of the pulmonary vessels in the lungs as in cirrhosis and emphysema.

There are conditions affecting the heart, as the use of tea, alcohol and tobacco; disturbed innervation as in exopthalmic goitre; derangements of the vertebrae, and ribs corresponding to the upper five dorsals; downward displacements of the floating ribs causing a prolapsus of the diaphragm and a consequent retardation of blood through it to and from

the heart will markedly effect the heart's action. Simple hypertrophy never occurs in the auricles; it is always accompanied with dilatation. The condition develops in the left auricle in mitral lesions; in the right auricle when there are disturbances of the pulmonary circulation. The tricuspid is rarely effected primarily.

Morbid Anatomy.—The left side of the heart is more commonly enlarged than the right; the ventricles than the auricles. The shape of the heart varies when the left ventricle is hypertrophied, the conical shape being more or less lost; it lies more horizontally and is elongated. When both ventricles are enlarged the heart is round. When the right ventricle is affected it occupies the largest part of the apex.

The increase in the size of the heart is probably due to a numerical increase in the muscle cells. The muscle is firm, of deep red color and cuts with considerable resistance. Normally the heart weighs from eight to nine ounces. In general hypertrophy it may weigh from fifteen to thirty ounces.

Symptoms.—Hypertrophy being a conservative process or an act of compensation does not necessarily at first present any symptoms. At the beginning there is rarely any pain but a sense of fullness and discomfort is present. As the hypertrophy increases the arteries become fuller, the veins less full and the circulation accelerated. Epistaxis may be of frequent occurrence and the face congested. Pains occur in the praecordial region. There is nervousness, cough and vertigo.

In hypertrophy of the left ventricle the apex is lower and to the left. The carotids pulsate visibly and the radial pulse is strong and tense. Percussion reveals enlargement to the left and downward. The first sound is louder and prolonged. The aortic second sound is intensified.

In hypertrophy of the right ventricle the enlargement is to the right edge of the sternum. The second sound in the

pulmonary area is increased. The apex beat is displaced outward. The pulse at the wrist is usually small.

Hypertrophy of the auricles always occur with dilatation, which is most common in the left auricle. The physical signs are characteristic. They are caused by diseases of the mitral and tricuspid valves and diseases of the lungs as emphysema and cirrhosis.

Sequelae.—Valvular diseases; degeneration of the arteries; dilatation of the heart; fatty degeneration of the cardiac tissues; apoplexy.

Diagnosis.—If a careful examination is made hypertrophy can hardly be mistaken for any other disease. There may be a resemblance to peri-cardial effusion, pleuritic effusion, aneurism or mediastinal tumor, when near the heart.

Prognosis.—Depends largely upon the cause producing the hypertrophy. Remember that hypertrophy is a compensatory act. The prognosis is more or less unfavorable if resulting from emphysema, Bright's disease or in old age; also in degeneration of the vessels. In most cases of functional over-action persistent treatment can usually accomplish considerable.

Treatment.—The treatment must be according to the cause of the hypertrophy. There are many etiological factors, consequently the treatment depends upon the influence of these factors. The principal treatment will be found under endocarditis as valvular diseases are usually caused by endocarditis and hypertrophy of the heart is a conservative process of nature, as an act of compensation secondary to valvular and arterial lesions. The indications are to lessen the force and number of pulsations of the heart and remove the cause if possible.

DILATATION OF THE HEART.

Definition.—Enlargement of the heart, the walls of which may be thin but more commonly they are thickened.

Varieties.—Dilatation with thickening of the walls and dilatation with thinning of the walls.

Etiology.—Dilatation of the heart may be produced by impaired nutrition of the cardiac muscle or increased endocardial tension. More frequently the two causes act jointly, although they may act singly.

Impaired nutrition of the cardiac muscle may diminish the resisting power and thus cause dilatation. Weakening of the cardiac walls may occur in scarlatina, typhoid, typhus, rheumatic fever, etc. It is met with in chlorosis, anaemia and leukaemia.

Increased endocardial tension occurs in sudden extreme exertions and in valvular diseases. The important causes are considered under hypertrophy.

Morbid Anatomy.—The right side is more commonly affected than the left. In advanced aortic incompetency all the divisions may be dilated. When one ventricle alone is dilated the septum may be seen to bulge. In extensive dilatation, the auriculo-ventricular rings are often dilated. Other orifices may also be dilated. The condition is often associated with hypertrophy and fatty degeneration. The muscle may be normal in appearance. The endocardium is often opaque, and roughened in patches.

There is degeneration of the ganglia of the heart.

Symptoms.—Dilatation causes weakness of the walls of the heart, but as long as the hypertrophied walls can compensate no symptoms result. When the hypertrophy weakens greater dilatation occurs and symptoms of venous stasis appears as dropsy, feeble irregular pulse, dyspnoea, cough and scanty urine. In some instances there may be brief precordial distress, faintness or palpitation.

Physical Signs—Inspection.—The apex beat is diffuse and feeble, or it may not exist. As observed by Walshe the impulse may be visible and yet not palpable.

Palpation.—The impulse is diffuse, feeble and fluttering. The pulse is small, rapid and irregular, rarely is it slow.

Percussion.—The area of lateral dullness is increased to the right. There is increase in the dullness downward to the sixth interspace and upward to the second rib in many cases.

Auscultation.—The sounds are weak and sharp. The first sound is shorter, lacks its muscular element and becomes more like the second. The sounds are obscured, the cardiac murmurs are present. In many cases the characteristic gallop rhythm is present.

When the right heart is chiefly dilated the true apex beat cannot be felt while an impulse may be felt below the xiphoid cartilage and a wavy impulse is seen in the fourth, fifth and sixth interspaces to the left of the sternum.

Diagnosis.—When a clear history can be obtained together with the characteristic features the diagnosis can be readily made.

Prognosis.—As a rule the prognosis is bad.

Treatment.—The treatment of dilatation is that of valvular heart disease. It is important that the patient should have plenty of rest, suitable food and regulated exercises.

MYOCARDITIS.

Myocarditis is an acute or chronic inflammation of the muscle substance of the heart.

Etiology.—This affection is met with in fevers, in connection with endocarditis and pericarditis. Septic emboli may block the coronary arteries in connection with pyaemia, septicemia and malignant endocarditis and cause infarcts in the myocardium with abscess formation. Males are affected more often than females.

Morbid Anatomy.—*Acute Interstitial Myocarditis.*—Changes take place in the intermuscular connective tissue. This becomes swollen and round-cell infiltration takes place. The muscle substance is pale and soft.

Acute Parenchymatous Degeneration.—This is characterized by degeneration of the muscle fibres which are infiltrated with granules. The cardiac muscle throughout is pale, turbid and soft.

Acute Suppurative Myocarditis.—This condition is rare. In this form abscesses occur which vary in size from a pin's head to a pea. They vary greatly in number and are usually multiple. They may not cause any disturbance and may not be recognized before death. On the other hand the abscess may rupture into the heart cavities, pericardium, or they may perforate the intra-ventricular septum, thus allowing the venous and arterial blood to intermingle. It may cause a cardiac aneurism.

Symptoms.—These are very uncertain and are practically negative. If during the course of any of the causal diseases the pulse suddenly becomes rapid, small, irregular and compressible and palpitation and syncope develop, all of which point to cardiac weakness, myocarditis may be suspected. Signs of venous stasis develop later in the affection. The physical signs are those of dilatation.

Prognosis.—This is extremely grave. Cases do, however, recover.

Treatment.—The treatment is the same as that given under endocarditis and pericarditis. Rest in bed is absolutely necessary. Pay particular attention to the nourishment and to the hygienic surroundings of the patient.

CHRONIC MYOCARDITIS.

Synonym.—Fibrous myocarditis.

Etiology.—Among the causes of this form of myocarditis are the excessive use of tobacco or alcohol, gout, rheuma-

tism, malaria, diabetes, chronic nephritis, syphilis and lead poisoning. Acute interstitial myocarditis may lead to the chronic form. This form is "commonly caused by the narrowing of a coronary branch in a process of obliterative endarteritis" (Osler). It may be due to injuries of the anterior and lateral portions of the chest. Males of middle life are more predisposed to chronic myocarditis.

Morbid Anatomy.—The changes occur most frequently in the left ventricle wall and the septum, but they may occur in any portion. The patches and streaks that are in the walls are sometimes only seen upon very careful examination. They are of a gray or grayish white color and when fibres that have undergone fatty degeneration are intermingled, they have a grayish yellow tint. The condition may be associated with hypertrophy and dilatation. A part of one of the heart cavities may become dilated, producing what is known as cardiac aneurism. There is destruction of the muscular fasciculi with subsequent development of new fibrous tissue. Fatty degeneration is also seen.

Symptoms.—Advanced fibroid myocarditis may be present without any symptoms. Slight degrees present no symptoms. The symptoms when present are a feeble, irregular, slow pulse, attacks of angina pectoris and sometimes arrhythmia. If fatty degeneration is also present the pulse will be quickened and irregular.

Diagnosis.—This is often very difficult and it requires careful and persistent study of a case to be able to make a correct diagnosis.

Prognosis.—This is grave, as it is a fatal disease. Sudden death is liable to occur at any time from complete obstruction to the coronary arteries as this condition is associated with sclerosis and narrowing of these arteries or their branches.

Treatment.—The treatment of chronic myocarditis is largely included in chronic endocarditis. The cause of the disease should be determined if possible. Careful treatment to the ribs of the left side from the first to the sixth and the corresponding vertebrae will be of great aid in controlling the disease. Attention should be given to the diet and hygiene of the patient. Outdoor life, bathing of the skin, and careful treatment of the vaso-motor nerves will be of great help.

DEGENERATIONS OF THE CARDIAC MUSCLE.

Under the term *fatty heart* are embraced two affections. Fatty degeneration in which the sarcous substance of the fasciculi is converted into fat; and fatty overgrowths in which an abnormal amount of fat is deposited in and about the heart.

Fatty degeneration is a very common condition and is due to an interference with the nutrition of the cardiac muscles. It is found in the impaired nutrition of old age, of cachectic states, of grave infectious diseases and of wasting diseases. In poisoning by arsenic and phosphorus, intense fatty degeneration is produced. Pericarditis may be associated with changes in the superficial layers of the cardiac muscle. Lesions of the coronary arteries will produce this condition; and also impairment of the oxygen carrying power of the blood. It occurs most frequently in men after forty years of age.

Anatomically, the condition may be either general or local. The left ventricle is most frequently affected. The capillary muscles and trabeculae are dotted and streaked with yellow fatty matter. When the condition is general the heart is dilated, flabby and relaxed, and of a light yellow or yellowish brown color, and also soft and friable. Microscopically, the muscular fasciculi exhibit a loss of nuclei,

and oil drops and granules appear in the fibres. In advanced grades the fibres are occupied throughout by minute globules.

Symptoms.—The affection may be present in advanced form without presenting any symptoms. Slight degrees and localized fatty degeneration are unrecognizable. Dilatation must be present to produce symptoms. This is apt to occur early. Dyspnoea, asthma, cough, angina pectoris, dropsy, slow weak pulse, palpitation, and toward the end Cheyne-Stokes breathing may appear. Mental symptoms such as maniacal delusions may come on and last for weeks.

Prognosis.—This is very grave. Death may occur suddenly on slight exertion.

Treatment.—The treatment is largely that of dilatation of the heart. An effort must be made to determine the cause, and treatment should be applied accordingly. Considerable can be done in improving the nutrition of the tissues of the heart by hygienic and dietetic measures. Light exercises will often be of aid, but care has to be taken that the exercises do not tax the patient too severely. A general treatment of the body might be a helpful measure in invigorating the system as a whole and toning the cardiac tissues. The diet should be nutritious, largely nitrogenous.

Raising the ribs over the heart and increasing the chest expansion will be of help in cases where there are attacks of dyspnoea and angina. When there are attacks simulating apoplexy lay the patient flat upon the back with the head slightly elevated.

FATTY INFILTRATION OR FATTY OVER-GROWTH.

This forms a part of general obesity and sooner or later this infiltration impairs the nutrition of the cardiac muscle and true fatty degeneration results. This form occurs most frequently in men and between the ages of forty and seventy years.

The characteristic changes consist in an increase in the normal fat. The entire heart may be enveloped in a thick sheathing of fat. The fat may also be deposited between the fasciculi, sometimes reaching the endocardium.

Symptoms.—Fatty overgrowth is certain to exist in extreme obesity. No symptoms are produced until the muscular fibres weaken so that dilatation occurs.

Diagnosis.—The presence of extreme obesity combined with signs of cardiac weakness point to fatty overgrowth.

Prognosis.—The prognosis is favorable.

Treatment.—The treatment of fatty overgrowth of the heart is the same as that of obesity.

OTHER DEGENERATIONS OF THE MYOCARDIUM.

Amyloid Degeneration.—This form is rare. It attacks the blood vessels and intermuscular connective tissue and not the fibres.

Hyaline Degeneration.—Zenker's hyaline transformation occurs sometimes in prolonged fevers. It attacks the muscular fasciculi. The fibres are swollen, translucent and homogeneous and the striae are indistinct or absent.

Calcareous Degeneration.—This is a rare condition. The muscular fibres of the myocardium are infiltrated with lime and salts.

Brown Atrophy.—This is commonly seen in hearts of the aged and in chronic valvular diseases. In pronounced cases the heart muscle is of a dark red brown and firmer in consistence than the normal heart. There is an accumulation of yellowish brown pigment granules in the muscular fibres, especially about the nuclei.

NEUROSES OF THE HEART—PALPITATION.

Definition.—A more or less rapid action of the heart of which the patient is conscious. There is usually an irreg-

ular or forcible action of the heart, as well as a frequency of the heart beat.

Etiology.—Females are more liable to be affected than males. It often occurs at puberty during menstruation and at the climacteric period. Anaemia, the acute infectious diseases, dyspepsia, disturbances of the ovaries and other pelvic organs are common causes. The abuse of coffee, tea, alcohol, tobacco, diseases of the stomach, overwork, fright, grief, anxiety and sexual excesses are causal factors. Palpitation may be associated with organic diseases of the heart, but as a rule it is a purely nervous affection.

Symptoms.—The patient's perception of increased action and force of the heart's action is the essential element in palpitation. The action of the heart varies greatly and at times it may be a mere fluttering which lasts but a few minutes. In severe cases the heart beats violently and the pulse may be rapidly increased and reach 160 or more. The face is usually pale but may be flushed. The heart's action is not increased in some cases.

Physical Signs.—These are usually negative. On auscultation the sounds are generally lower than normal. A murmur may be heard at the base, rarely at the apex of the heart. The attack may last only a few minutes, but sometimes it lasts for hours or days.

Prognosis.—The prognosis is generally favorable.

Treatment.—Raising of the ribs over the heart and lowering of the first rib; or correcting the clavicle in a few instances; or stimulating along the upper dorsal region will usually quiet the heart's action. Stimulation of the vagi nerves as they pass along the side of the neck may be all that is necessary; in some cases inhibition of the superior cervical sympathetic or of the middle cervical region, acting on the depressor nerve of the heart, will also lessen the tumultuous action of the heart.

All reflex disturbances as a displaced uterus, etc., must be removed before the palpitation can be stopped. Rest and gaining the confidence of the patient is of great importance. In anaemic cases hygienic measures and a proper diet coupled with the treatment for anaemia is indicated. If the attack is severe the patient should rest in a recumbent posture and drink something warm, besides taking the indicated treatment.

TREATMENT OF TACHYCARDIA, BRACHYCARDIA AND ARRYTHMIA.

Tachycardia.—The treatment of cases where there is an abnormal rapidity of the heart, is somewhat similar to the treatment of palpitation. Many times the cause is due to reflex irritations from various sources; hence the treatment in such cases is to prevent the source of irritation. Otherwise the same treatment should be applied as in palpitation. Out door exercise and cold bathing are helpful measures.

Drachycardia.—In the treatment of a slow heart, as in the treatment of other neuroses of the heart, the causes have to be determined first. A stimulating treatment to the cervical sympathetics and an inhibitory treatment to the pneumogastric will usually readily relieve the condition, at least temporarily. Many times lesions are found directly to these nerves and a correction of the lesion is all that is necessary. Inhibition of the pneumogastric probably affects the activity of the depressor nerve; and stimulation of the cervical sympathetics, besides acting on the accelerator fibres of the heart directly, influences the blood supply of the body and thus increases arterial tension.

Arrythmia.—When there is an irregular pulse, lesions may be located in the cervical region interfering with the heart's innervation directly, although the vagi and sympathetic nerves or probably in some cases the vaso-motor

nerves to the heart are disturbed. Also the cardiac ganglia may be affected. I have observed that in many cases the first, second or third ribs on the left side are at fault and a correction of these ribs would relieve the difficulty at once. It is claimed that there are nerves at the fourth and fifth dorsals that tend to control the rhythm of the heart beat. Of course there are many other causes, as organic diseases of the heart or other organs, that would produce an irregular pulse; and the relief would depend largely upon the cure of the primary disease.

Occasionally in neuroses of the heart the disturbing factor may be due to a dislocated rib above the sixth. The fifth rib is apt to be a source of irritation to the heart when dislocated.

Another symptom that may accompany a dislocated rib is shortness of breath and almost invariably relief can be given the sufferer by correcting the dislocated rib which is usually downward. When various symptoms arise along the anterior part of the chest derangements are usually found with the ribs or cartilages at the seat of complaint.

ANGINA PECTORIS.

Synonyms.—Stenocardia; breast-pang.

Definition.—A paroxysm of violent pain in the region of the heart, extending into the neck, back and arms; and in violent attacks there is a sense of impending death.

It is a symptom rather than a disease associated with a number of morbid conditions of the heart and vessels.

Etiology.—It occurs most frequently in males after the fortieth year. It is found in connection with arterio-sclerosis, simple hypertrophy of the heart, aortic stenosis, aortic insufficiency and increased arterial tension. The exciting causes of an attack are undue exertion and mental emotion. Lesions are invariably found to the ribs over the heart and to the corresponding vertebrae.

Morbid Anatomy.—The condition usually found is disease of the coronary arteries. Advanced sclerosis of the coronary arteries may occur, however, without angina. Obstructions of the coronary arteries from atheroma or thrombosis producing degeneration of the cardiac muscles is generally found.

Symptoms.—The paroxysm begins suddenly, usually, during exertion or intense mental emotion. The pain is agonizing and of a grip-like character, and there is a feeling of impending death. The pains radiate up the neck and down the arms, and there may be numbness or tingling in the fingers, and over the cardiac region. There is usually extreme pallor, the skin is ashen gray and frequently a profuse sweat breaks out over the surface. Dyspnoea may be present. The duration of the paroxysm varies from a few seconds to a minute or two, at the end of this time the patient passes out of the attack or dies in it. The attacks occur at widely different intervals, varying from a few days to many years. After the paroxysm there is instant relief.

Diagnosis.—The only condition with which true angina pectoris is liable to be confounded is pseudo-angina pectoris. Pseudo-angina or hysterical angina occurs chiefly in women or in neurasthenic men. The attack usually occurs at night and is unassociated with organic heart disease. There is emotional excitement and the attack lasts one or two hours which is much longer than that of true angina.

Prognosis.—The prognosis is always unfavorable, although many cases live for a number of years. A few cases have recovered under a thorough course of treatment.

Treatment.—The treatment of angina pectoris consists in correcting the disordered upper dorsal vertebrae and the upper left ribs over the heart. Invariably lesions are found in this region and if the treatment is applied to correct these disorders the attack can be relieved. By following up the

treatment during the intervals a number of cases can be practically cured. A common lesion found is a slight lateral curvature in the upper dorsal region. This curvature is oftentimes great enough to cause a dislocation of several of the ribs which certainly complicates the disorder, at least as far as a quick cure is concerned.

During the attack raise the ribs over the heart at the point of constriction so as to relieve the impinged nerve fibres. The vagi and phrenic nerves may also be at fault in some cases. The sensory nerves to the heart are from the first, second and third dorsals.

Ice bags or heat applied locally will be a helpful measure. In cases where there is high arterial tension an inhibitory treatment to the upper and middle cervical regions will be of special aid, as it relieves this tension by affecting the vaso-motor nerves. This treatment will at least overcome the vaso-motor form of angina pectoris. Hot foot baths and friction will also be found of value.

The patient should at all times avoid any excitement, and live a very quiet life. He should take the best of care of himself; and his food should be nutritious. In pseudo-angina the treatment is to relieve the irritation to the nerves affected.

DISEASES OF THE ARTERIES.

ARTERIO SCLEROSIS.

Synonyms.—Arterio-capillary fibrosis; atheroma; endarteritis chronica deformans.

Definition.—A thickening of the intima of the arteries due to an inflammatory increase of the connective tissue, associated with more or less fatty degeneration and calcification.

Etiology.—Old age, alcohol, lead, gout, syphilis, rheumatism, laborious work, over-eating, nephritis, and calcareous water tend to produce this condition.

Morbid Anatomy.—The arteries are thickened, tortuous and rigid. The intima may be occupied by rough calcareous plates. In extreme cases the sub-endothelial tissue undergoes degeneration and breaks down in spots, forming "atheromatous abscesses." Microscopically there is found more or less fatty degeneration of the different coats, and an overgrowth of connective tissue in the intima.

Symptoms.—*Circulatory.*—There is a sluggish high tension pulse and accentuation of the second aortic sound. There is also dyspnoea, severe pains in the left side, palpitation, and the left ventricle is hypertrophied.

Cerebral.—Such symptoms as headache, tinnitus, vertigo, syncopal or elliptiform attacks may be present.

Renal.—There is an increase in the quantity of urine, which is of a pale color and low specific gravity. At times it is albuminous.

Sequelae.—Cardiac dilatation, heart failure, paralysis, apoplexy, fatty heart, aneurism, contracted or senile kidney, angina pectoris, and in extreme cases gangrene of the extremities.

Treatment.—The treatment must necessarily consist, principally, in the removal of such conditions that are producing the degeneration. Alcoholism, gout, rheumatism, syphilis, etc., must be remedied before there can be much change in the arteries. Free-living, and all excitement must be stopped. Besides treatment of the primary disease a general treatment will be of much avail in equalizing and reducing arterial tension. The bowels and kidneys should be kept active, and the general health of the patient carefully watched. Keeping the skin active by daily baths is an essential factor in the treatment.

ANEURISM.

Definition.—Aneurism is a circumscribed dilatation of an artery.

A *true aneurism* is one in which the sac is formed of one or more coats of the artery and may be fusiform, saccular and cylindrical.

A *false aneurism* is one in which the internal coat of the artery alone gives way, and the blood dissects between the layers of the vessel walls. It is also called a dissecting aneurism.

An *arterio-venous aneurism* results when a direct communication is established between an artery and a vein and it is termed an aneurismal varix, or a sac may intervene (varicose aneurism).

Etiology.—Sudden great strain and the conditions that lead to arterial degeneration, like syphilis, rheumatism, gout and alcoholism are predisposing causes. The male sex at middle life suffer most.

ANEURISM OF THE THORACIC AORTA.

The arch of the aorta is the most common seat. It may occur in the ascending, transverse and descending portions and in the thoracic aorta below the arch. They vary greatly in size and shape.

Symptoms.—Aneurisms may exist without any symptoms or apparent physical signs, especially if they are small. The most important symptoms are the resul of direct pressure. Dyspnoea arises most frequently as a result of pressure upon the trachea, the left bronchus, or upon the recurrent laryngeal nerve. Paralysis or spasm of the vocal cords may be due to pressure upon the left recurrent laryngeal nerve; this causes alterations in the voice, as hoarseness, stridor and aphonia. A cough is usually present and it is of a metallic, barking character when due to spasm of the vocal

cord. Dysphagia results from pressure on the oesophagus. Pain may result from pressure upon the intercostal nerves. Compression of the vagus will produce vomiting. Dilatation, or contraction of the pupils and unilateral sweating, may result from compression and irritation of the sympathetic nervous system. The pulse in the vessels beyond the aneurism is slow. Hence the pulse in one radial may be delayed and diminished in volume. This may be due to the narrowing or distorting of the arterial orifice by the aneurism, or the diffusion or spending of the current within the sac.

Haemorrhage may result from rupture of the sac into the lung, bronchus or trachea. The bleeding may be profuse often producing sudden death. If the aneurism presses upon the deep seated veins there may be venous engorgement, cyanosis and local oedema.

Physical Signs.—*Inspection.*—In many instances this is negative, but usually sooner or later an abnormal prominence and pulsation in the upper sternal region is observed.

Palpation.—An expansile pulsation and a distinct systolic shock can be felt over the aneurismal sac.

Percussion.—Dullness and increased resistance may be present.

Auscultation.—A murmur or bruit is generally heard over the aneurism corresponding with the first sound of the heart, but more intense. An important sign is a much intensified ringing second sound which is almost always heard in large aneurisms of the arch of the aorta.

Diagnosis.—Care has to be taken to differentiate thoracic aneurism from solid tumors, the pulsating aorta of nervous women, pulsating empyema and pulmonary tuberculosis.

Prognosis.—The prognosis is always grave. Death may result from exhaustion, rupture of the aneurism into the

pericardium, trachea, bronchi, oesophagus, lungs, heart or pleura, heart failure and direct pressure.

ANEURISM OF THE ABDOMINAL AORTA.

The favorite seat of abdominal aneurism is near the coeliac axis. The tumor may be fusiform or saccular and it is sometimes multiple.

Symptoms.—Pain in the back or passing around the sides, delay in the femoral pulse and gastro-intestinal symptoms, especially vomiting, are the chief symptoms.

Physical Signs—Inspection.—Marked pulsation in the epigastric region and occasionally a definite tumor may be visible.

Palpation.—A definite tumor can be felt. The pulse is forcible, expansile and it may be doubled when the tumor hugs the diaphragm.

Percussion.—Dullness may be elicited if the growth is large.

Auscultation.—A systolic murmur is generally audible. A diastolic murmur is sometimes present.

Diagnosis.—A certain diagnosis demands the presence of a definite tumor which can be grasped and which has a heaving expansile pulsation. The presence of pulsation, a thrill or a systolic murmur, does not justify the diagnosis of abdominal aneurism, as this may be simulated by other conditions.

The pulsating aorta of nervous women may simulate aneurism. There is no distinct tumor that can be grasped and the beating is like a pulsating cord, an up and down movement, not expansile.

Solid growths located over the abdominal aorta may manifest pulsation, a thrill and a systolic murmur, causing them to be mistaken for an aneurism. In this the pulsation is not expansile, and is frequently lost when the patient is placed in the knee-elbow position.

Prognosis.—The prognosis is unfavorable. Death usually results from rupture. After development of the aneurism the duration of life is from one to four years.

Treatment of Aneurisms.—The object to be obtained in the treatment of aneurism is to lessen intravascular pressure and to restore a more normal tonicity of the vessel wall. By diminishing intravascular pressure, coagulation of the blood within the aneurism will be favored. Restoring contraction of the sac is important; possibly lesions to the vasomotor nerves of the involved blood vessels would favor a lessened tonicity of the walls of the vessel; also a prolapsed diaphragm might predispose to an aneurism in the thoracic aorta.

In many cases the treatment can only be palliative. Various measures have been employed to produce clotting and consolidation within the sac of the aneurism. Tufnell's method has been commonly employed in early cases. It consists of absolute rest in bed for two or three months. The mind should also be quiet. A dry diet is given—for breakfast, two ounces of bread and butter and two ounces of milk; for dinner, two or three ounces of meat and three or four ounces of milk or claret; for supper, two ounces of bread and two ounces of milk. The object of the diet is to lessen the blood volume and reduce the blood pressure within the sac. Also, to render the blood more fibrinous and on the whole to favor coagulation.

Ligation of distal arteries have been employed in aneurisms, also, acupuncture and electrolysis with varying success. Ice bags applied locally give great relief when pain is severe.

In aneurism of the abdominal aorta pressure may be employed. Steady pressure for twenty-four hours under an anaesthetic on the proximal portion of the vessel is necessary. The object to be gained is coagulation.

In all cases of aneurism the patient should live a quiet life and avoid all sudden exertions. Absolute rest in a recumbent position is necessary in severe cases; it lessens the number of heart beats and reduces blood pressure.

SECTION IX.

DISEASES OF THE BLOOD AND DUCTLESS GLANDS.

ANAEMIA.

Definition.—Anaemia is a condition in which there is a diminution in the amount of blood as a whole, its red corpuscles, its albumin or its haemaglobin, i. e., a deficiency in one or more of its constituents. The condition may be general or local.

Anaemias may be subdivided into (1) primary or essential anaemia. (2) secondary or symptomatic anaemia.

THE PRIMARY OR ESSENTIAL ANAEMIAS—CHLOROSIS.

Synonyms.—Green sickness; primary anaemia; essential anaemia; morbus virgineus; chloraemia; chloranaemia.

Definition.—A pronounced anaemia most frequently met with in girls about the age of puberty and characterized by great reduction in the haemoglobin.

Etiology.—This disease is found throughout the entire world, commonly in young girls about the age of puberty. Those in which the pubis and breasts are undeveloped are especially apt to be affected with chlorosis. Young women considerably past puberty and girls before puberty, may become chlorotic, but such cases are somewhat rare. Blondes suffer more frequently than brunettes; the weak oftener than the strong. Over-work, especially in badly lighted, closely confined and illy ventilated rooms is a predisposing cause. A lack of nutritious food and out door exercise and too much stair climbing are also predisposing causes. Menstrual disturbances are a cause, as well as a sequence of chlorosis. According to Sir Andrew Clark, constipation plays an important role, and he suggests that the condition might really be a copraemia due to the absorption of the toxic ptomanies and lecomaines from the colon.

Morbid Anatomy.—It is very seldom that the disease proves fatal. There is no loss of fat. Hyperplasia of the

vascular system and of the uterus, and imperfect development of the genitalia have been noticed. The whole heart is dilated and the left ventricle usually hypertrophied.

Symptoms.—The blood examination shows a very marked deduction in the haemoglobin, while the number of red corpuscles is not greatly reduced and may even be normal. Microscopically the red cells are found to be paler than normal and in severe cases the corpuscles may be extremely irregular in size and shape.

There is palor and weakness without loss of flesh. The skin has a peculiar greenish tint. A capricious appetite (pica), breathlessness, palpitation, constipation and sometimes epigastric pain are common symptoms. There is a tendency to hysterical outbreaks and menstrual disturbances.

Physical examination shows the heart to be slightly dilated. A systolic murmur is heard at the base and in severe cases it may be also heard at the apex. A soft continuous murmur the *bruit de diable,* or humming top murmur, is heard over the jugular vein on the right side of the neck.

The pulse is usually full and easily compressible. Thrombosis of the large veins, or of the femoral or of the cranial sinus may occur.

Diagnosis.—In cases in which the greenish palor of the face is marked, the disease can be recognized at a glance. Chlorosis may be confounded with anaemia in the early stage of pulmonary tuberculosis.

Organic heart disease is simulated by the breathlessness and palpitation. Bright's disease may be mistaken for chlorosis on account of the oedema of the feet, and general palor present in the latter affection.

Prognosis.—This is always favorable. Appropriate treatment is generally followed by speedy recovery. Relapses are common.

Treatment.—The administration of iron in cases of chlorosis by medical practitioners is lauded very highly by them. They consider such a treatment a specific one. Undoubtedly it is a specific one to the tissues of the blood, but are the tissues of the blood primarily at fault? Does not the trouble lie in the assimilation of properties, and the condition of the blood is an effect? There is plenty of iron in the food, even upon examination of the fecal matter of a chlorotic patient iron can be found. We cannot expect very much of the iron given to be absorbed, in fact, it is well known by all that most of it is wasted; besides it acts as an astringent to the intestinal juices and produces many uncomfortable symptoms.

The object of osteopathic treatment is to correct the inability to assimilate the iron in the food, by paying attention to the nervous and lymphatic systems and to hygienic measures. The osteopath corrects various derangements that may be found along the spinal column to the nervous and vascular channels, and manipulates all muscles that are found to be contracted or flabby with a view of creating a greater demand for nourishment to the tissues and a consequent better digestion. Treatment of the cervical, solar and hypogastric plexuses will tone up the nervous system and increase the circulation so that digestion is aided, and dyspnoea is relieved by the proper oxygenation of the blood. It is not external chemical properties that the system needs, for it contains within its tissues all the properties and forces necessary for health; but the system needs help to relieve it from its embarassed and over-burdened condition, so that the forces of life may act unobstructed. Consequently all that anyone can hope to do is to relieve these obstructions by correcting any abnormalities and by having the patient observe hygienic rules. This is the secret of osteopathic work at any and all times. Coupled with the

osteopathic manipulations for the cure of chlorosis is the use of food that is easily digested (eggs, milk, green vegetables, meats, etc.), plenty of pure air, rest and sleep, with a change of occupation, if possible.

PROGRESSIVE PERNICIOUS ANAEMIA.

Synonym.—Idiopathic anaemia.

Definition.—A grave form of anaemia in which the red corpuscles have been destroyed and reduced in number, unassociated with any definite causal lesion.

Etiology.—Males are more frequently affected than females. Those past middle age are most commonly affected, but children also have it. The disease is widely distributed. The etiology is very obscure. Unfavorable hygienic surroundings and insufficient nourishment favor its development. Pregnancy, parturition, advanced atrophy of the stomach, profound and long continued gastro-intestinal disease, and intestinal parasites, especially the anchylostomum and bothriocepalus, predispose to the disease. Severe or prolonged haemorrhages are other causes. In many cases no adequate cause is apparent. Addison characterized a group of cases by a "general anaemia occurring without any discoverable cause whatever, cases in which there had been no previous loss of blood, no exhausting diarrhoea, no chlorosis, no purpura, no renal, splenic, miasmatic, glandular, strumous or malignant disease." According to one theory these cases are due to increased haemolysis excited by absorption of poisons from the intestines and elsewhere, on the other hand other authorities believe it is due to defective haemogenesis.

Morbid Anatomy.—The skin has a lemon tint in the majority of cases, the body is rarely emaciated, the fat is a light yellow and the muscles are usually intensely red in color. Extreme fatty degeneration occurs in this disease.

The heart is large and the heart cavity contains very little blood. The heart muscle is flabby and of a pale light yellow color. There are changes in the ganglion cells of the sympathetic, and sclerosis of the posterior column of the cord. Ecchymoses sometimes occur in the skin and mucous membranes. The lymph glands are enlarged, swollen and of a deep red color. The bone marrow is dark red, the lymphoid cells are increased, numerous nucleated red corpuscles are present, and the fat vesicles are absent.

Symptoms.—The approach of the symptoms of pernicious anaemia is so slow and insidious, that it is hardly ever possible to fix upon the date of the beginning of the weariness, or of the languor which slowly develops into extreme debility; which at last prostrates the patient so that he can not rise from bed. The pallor soon becomes marked. There is shortness of breath and palpitation of the heart on the slightest exertion. Emaciation is rare. The skin soon becomes of a lemon yellow tint. The appetite fails, while nausea, vomiting and diarrhoea may be present at first, and gradually grows worse. The pulse is large but soft and jerky. The mucous membranes—lips, gums and conjunctivae—seem bloodless. Haemic mumurs are constantly present. The capillary pulse and pulsating veins are frequently seen. Cutaneous and retinal haemorrhages are frequent. Moderate irregular fever is commonly present. Numbness and tingling and sometimes tabetic symptoms appear.

The Blood.—The blood is usually pale and watery. The number of red corpuscles is greatly reduced. The leucocytes are usually not increased; they may be even somewhat reduced. The haemoglobin may be reduced but not proportionately, rarely it is found increased. Nucleated red blood corpuscles are invariably present, especially the large forms (gigantoblasts), which are generally numerous in this disease. The red corpuscles are irregular in size and shape.

Diagnosis.—At first the diagnosis may be uncertain but the distinctive symptoms soon decide. The relative increase or at least no proportionate decrease in the haemoglobin and the large forms of nucleated red blood corpuscles found in examination of the blood, together with a marked anaemia, digestive disturbances, and profound prostration are important symptoms.

Prognosis.—As a rule the disease proves fatal, although, the prognosis under careful osteopathic treatment is more favorable than under other treatment.

Treatment.—The treatment of this form of anaemia is largely the same as the treatment of chlorosis. Careful attention to the derangements of the spinal column, good food and suitable hygienic surroundings, constitutes the necessary treatment; a change of climate will many times be of great value. In this disease a general treatment would be indicated; by that I mean attention should be given the entire system to keep it in as healthy a condition as possible, by correcting the various lesions in the spinal column and ribs, relaxing the spinal muscles thoroughly and stimulating the various glands and excretory organs of the body. Everything should be done that is possible to prevent the destruction of the red corpuscles. The blood forming organs of the body should be thoroughly treated. Stimulation of these glands; with careful treatment of the entire circulation will tend to restore the blood to the normal, by the natural power of regeneration. Toast, meat juice, and bone marrow will be found to be the most suitable food.

LEUKAEMIA.

Definition.—A blood disease characterized by persistent increase in the colorless corpuscles of the blood; with lesions of the spleen, lymphatic glands or bone marrow, either of one or of the whole.

Etiology.—Nothing definite is known of the causes. It is most commonly seen in the middle period of life and in the male sex. An injury or blow in the splenic region, often precedes the development of leukaemia. Very likely lesions to the ribs over the spleen and the corresponding vertebrae, affecting vaso-motor nerves to the spleen would predispose to the disease. Hereditary influences, anxiety, worry, pregnancy, malaria and syphilis seem to favor its development. It is probably of infectious origin.

Morbid Anatomy.—Bodily emaciation and pallor may be extreme. Dropsy may be present. The heart and vessels are commonly found gorged with coagulated blood, and on account of the great increase in the leucocytes it is of a whitish or yellow color. The spleen is almost always enlarged. The blood vessels at the hilus are enlarged; the spleen is firm and cuts with resistance. The capsule may be thickened. The Malpighian bodies are usually invisible. Adhesions from between the spleen and the abdominal walls, diaphragm, stomach or other viscera may be found.

The bone marrow is involved in association with the spleen in the majority of cases. The fatty tissue has disappeared and is replaced by rich lymphoid and blood cells; in all stages of development.

The lymphatic glands may be enlarged, this may occur alone or in association with the splenic enlargement. The cervical, axillary, inguinal and peroneal glands are usually involved. They are generally distinct, soft and movable. The lymph follicles in the tonsils, tongue, pharynx and mouth may be enlarged. This may occur also in the solitary, and agminated glands of Peyer.

The liver is often enlarged, generally due to diffused leukaemic infiltration. The capillaries and interlobular tissues are distended with leucocytes. The same changes occasion-

ally occur in the kidneys. Leukaemic nodules may be found in other parts of the body also.

Symptoms.—At first the symptoms are those of intense anaemia. The first symptoms noted may be the swelling of the abdomen from enlargement of the spleen, or the enlarged lymphatic glands may first attract attention. Haemorrhages from the mucous membranes may occur early. There is moderate, irregular fever which may arise to 102 or 103 degrees F. The pulse is usually rapid, soft and compressible but sometimes full in volume. Dropsy generally occurs in advanced cases. Headache, dizziness and faint spells may occur, and sudden coma may follow cerebral haemorrhage.

The Blood.—The diagnosis must depend upon the examination of the blood. It is paler than normal. In the spleno-medullary form of leukaemia there is an enormous increase in the number of leucocytes. Nucleated red corpuscles usually normoblasts are present in considerable numbers. A characteristic feature is the presence of myelocytes which are large, mononuclear forms containing neutrophilic granules not found in normal blood. These make up about twenty-five per cent of the white cells. The red corpuscles are only moderately reduced. The haemoglobin may be reduced relatively or in a somewhat greater proportion.

Blood of Lymphatic Leukaemia.—The increase in the colorless cells is not so great as in the preceding form. The lymphocytes are the ones increased, all other leucocytes being relatively much diminished in number. Nucleated red corpuscles are rare.

Lymphatic leukaemia is rare, while it is more fatal and rapid in its course than the preceding form. It is more frequently met with in the young.

Diagnosis.—The diagnosis can only be determined by examination of the blood.

Prognosis.—This is unfavorable and in advanced cases hopeless. Recovery occasionally occurs. The course is usually from six to eight weeks in lymphatic leukaemia. In other forms from two to five years, or even longer.

Treatment.—The treatment is mainly a general one, although special attention should be given to the spleen and lymphatics and care taken that the patient receives plenty of fresh air and good food.

An out-door life in a dry climate with attention to hygienic living will be of great help to the spinal treatment. The bowels should be kept regulated. The diet should be a full one, with careful avoidance of anything that would lead to irritation of the stomach. All exposure and excesses are to be avoided.

SECONDARY ANAEMIA.

Under this form are included a large proportion of all cases. The most important groups are: (1) *anaemia from haemorrhage*—if the haemorrhage is copious acute secondary anaemia results. The watery and saline constituents of the blood are rapidly made up by absorption from the gastro-intestinal tract. The corpuscles and haemoglobin take a long time for regeneration, sometimes weeks or months before they reach the normal standard. The albuminous constituents are more rapidly restored.

(2) *Long continued drain* of the albuminous materials of the blood may produce marked anaemia, as in chronic Bright's disease, suppurative processes, prolonged lactation, chronic dysentery, cancer, etc.

(3) *Toxic Anaemia.*—These are the result of the absorption of lead, mercury, arsenic and phosphorus. Certain diseases, poisons, chronic malaria and syphilis produce anaemia. They act directly on the red corpuscles producing considerable destruction or by increasing the rate of ordinary consumption.

(4) *Anaemia from Inanition.*—This results from starvation which may be due to conditions which interfere with the proper reception and assimilation of the food, such as obstruction of the oesophagus by cancer, and in chronic dyspepsia. It may also be due to insufficient food supply, either in quality, quantity or both. The reduction of the blood plasma may be great, while the corpuscles are but slightly affected.

Treatment.—Rest and nourishing food is the principal treatment in secondary anaemia. The cause of the effection should be removed if possible. All that the system needs is an opportunity to overcome the defect and the percentage of red blood corpuscles will increase with great rapidity. The patient should be out in the open air when possible. All toxic substances are to be carefuly eliminated and their recurrence prevented. A careful treatment along the spine will aid in increasing the tissue activity.

HODGKIN'S DISEASE.

Synonyms.—Lymphatic anaemia; pseudo leukaemia; general lymphadenoma; adenia; malignant lymphoma.

Definition.—A disease characterized by progressive hyperplasia of the lymphatic glands with anaemia and occasionally secondary lymphoid growths of other organs (liver and spleen) and without a marked increase in the white corpuscles.

Etiology.—The causes are unknown. Lesions of the spinal column are found corresponding to the innervation of the lymphatic system. Such lesions may affect vasomotor or trophic fibre of the lymphatics. Depressing influences of all kinds seem to favor the disease. A large majority of the cases occur in males and between the ages of ten and forty years. In a large number of cases the disease develops insidiously and without any apparent cause.

Chronic skin diseases, various irritative conditions, chronic nasal catarrh, syphilis and malaria, giving rise to local glandular swelling, may precede a general development of the disease. Heredity may be the cause but this is doubtful.

Morbid Anatomy.—As a rule the enlarged glands are soft and elastic, though sometimes they are hard and dense. In the early stages they are small, isolated and readily moveable, while in the more advanced stages the glands are larger, fuse together and are surrounded by hard, dense capsular tissues forming a firm investment. The lymphatic growth may perforate the capsule and extend into the surrounding tissues. On section the tumors are found to be smooth, either soft or firm and of a grayish white appearance. Suppuration may occur especially in the superficial glands. Necrosis may occur in the harder tumors and sometimes caseation. The more superficial glands are usually first affected, then those of the submaxillary region, neck, axilla and groin, but the entire lymphatic system may be involved. Of the deep seated glands those of the thorax are most frequently affected; of the abdominal glands the retro-peritoneal are most often affected. The abdominal vessels, the sacral and lumbar nerves and the nerve plexuses may be compressed or interfered with by groups of the enlarged glands.

Microscopically, at first there is a simple hyperplasia of the lymph cells sometimes obscuring the reticulum which in a soft growth is expanded and can hardly be found; while in the harder enlargements the network of fibres can be distinctly seen. At first the relations of the lymph tract are maintained but as the gland becomes enlarged they become distorted and disturbed.

The spleen is generally enlarged but only slightly. The marrow of the bones may be converted into lymphoid tissue, sometimes pyoid in consistence. The tonsils, lingual

follicles, intestines, liver, kidneys, lungs, skin, retina and heart may have lymphoid tumors scattered throughout their substance. The nervous system may be involved and invasion of the brain and spinal cord may occur.

Symptoms.—Usually the first symptom to be noticed is enlargement of the glands of the neck, axillary or groin. Later signs of anaemia appear, palor, weakness, dyspnoea, headache, giddiness, palpitation, and oedema of the legs. Epistaxis occasionally occurs. Haemic murmurs are often heard over the heart. There may be fever, very irregular and variable in degree.

The symptoms due to pressure of the enlarged glands upon different structures varies greatly with the number, size and distribution of the tumors. Dyspnoea may arise from pressure upon the trachea. Pleuritic and abdominal effusion may occur from pressure producing venous obstructions. Pressure upon the pneumogastric nerve will interfere with the heart's action; inequality of the pupils and unilateral sweating of the face may be present as the result of pressure upon the cervical sympathetic. Entanglement of the nerves in the growth may cause pain. Bronzing of the skin may occur in connection with affections of the abdominal glands and is probably due to pressure upon the supra-renal capsules. Jaundice may occur from pressure upon the bile ducts. The blood is thin and pale and the red corpuscles are generally diminished in number. The leucocytes may be slightly increased.

Diagnosis.—The differential diagnosis between Hodgkin's disease and tuberculous adenitis with which it is often confounded will be found under tuberculous adenitis.

Prognosis.—Recovery is rare; it is almost invariably fatal. Duration is from a few months to three or four years. Death may occur by asthenia, pressure from a tumor, and rarely by coma.

Treatment.—A definite treatment cannot be given. Usually various spinal lesions are found which correspond directly with the lymphatic system. Possibly the nerves controlling the lymphatic system being obstructed have some influence in the cause of the disease. The special points of treatment are the cervical region to control the upper parts of the lymphatic system and the splanchnics to control the region of the receptaculum chyli, thoracic duct, spleen and liver.

Local treatment of the glands does not amount to much, in fact if one is not careful direct treatment to the gland does positive injury by bruising the gland. Treatment of the digestive organs; attention to the diet and hygienic surroundings is demanded.

ADDISON'S DISEASE.

Synonym.—Melasma supra-renalis.

Definition.—A constitutional affection characterized by chronic inflammation and degeneration of the supra-renal capsules, a pigmentation or bronzing of the skin, depressed circulation and prostration.

Etiology.—Male sex between the ages of twenty and forty, laborious work, injury (a blow upon the abdomen or back), displacement of the dorsal vertebrae from the eighth to twelfth, or of the upper lumbar, and caries of the spine are the predisposing causes.

Morbid Anatomy.—The commonest cause is tuberculosis. Atrophy, tumors, degeneration of the supra-renal capsules, pressure, inflammation or degeneration of the abdominal sympathetic ganglia are sometimes the cause. The blood in Addison's disease contains less fibrin and is deficient in red corpuscles while a slight increase of white corpuscles is found. Two theories have been advanced to explain the cause of the "bronzing" that is prevalent in Addison's dis-

ease. First, the disease according to Addison depends upon the loss of function of the adrenals. Experimental evidence goes to show that these glands furnish an internal secretion essential to normal metabolism. In cases where this bronzing is found with the adrenals healthy it is ascribed to disease of the semi-lunar ganglia which interferes with the vessels and lymphatics of the glands. The cases where the adrenals are diseased and yet no symptoms of Addison's disease, it is suggested that accessory glands may be present. Second, it is held that it is a disease of the abdominal sympathetic system which is generally involved in diseases of the adrenals but which can also become diseased by other chronic disorders which invade the solar plexus and ganglia. According to this it becomes an affection of the nervous system and in that case the pigmentation becomes an atrophic phenomenon (vaso-motor). The extreme debility is caused by the disturbed tissue metabolism. As the pneumogastric is also involved the heart, lungs and stomach will be affected.

Symptoms.—Onset insiduous, languor, moderate anaemia, great weakness, gastric irritability and pigmentation which ranges in color from a light yellow to deep brown and even almost black. With the gastric disturbances there is anorexia, nausea, vomiting and there may be diarrhoea. The heart's action is weak and the pulse is small and rapid. There is profound asthenia and dizziness and ringing in the ears upon the least exertion. As the disease advances there is marked prostration and the patient dies by syncope or from sheer exhaustion. There may be convulsions due to anemia of the brain. The urine is usually normal. There is sometimes polyuria, and the urinary pigments have been found to be increased.

Diagnosis.—The diagnosis cannot be based upon the pigmentation alone as other diseases produce the same symp-

toms, such as pregnancy, uterine disease, cancer, tuberculosis of the peritoneum, lymphoma, and hepatic disease; abnormal pigmentation occurs in some cases of exopthalmic goitre and continued filthiness. The deep discoloration of the skin is associated with melanotic cancer (in rare cases) and is also sometimes the result of prolonged use of arsenic. Other symptoms must thus be considered before making a diagnosis. In many cases it is difficult to diagnose Addison's disease in its early stages. Later asthenia, gastric irritability, nausea and tendency to fainting will aid in the diagnosis.

Prognosis.—The disease is generally incurable. Duration one to two years, although a few cases are rapid and prove fatal in a few weeks.

Treatment.—The general treatment indicated is rest and nutritious diet. Many patients enjoy a milk diet best. Special attention should be paid the lower splanchnics to control the slow inflammation of the glands. The vagi and phrenic nerves are to be considered as they influence the disease to a greater or less extent. The phrenic nerve is essentially controlled at the third, fourth and fifth cervicals and has certain fibres connected with it as low as the fourth dorsal. The vagi are generally treated best at the jugular foramen. The treatment of these nerves (vagi and phrenic) is extremely important. Dissection shows that the supra-renal capsules are of the nature of a nerve-depot besides having connection with the solar and renal plexuses. Injuries to the renal splanchnics may affect the supra-renal capsules. In some cases of Addison's disease the inflammation has been traced to the spinal cord. This would affect in particular the vaso-motor nerves to the glands; and as the gland is normally richly supplied with blood it would be likely to interfere with the internal secretion of the glands, which in all glands is emptied into the venous

or lymphatic systems and is so essential to the metabolism of the body.

Treatment should be applied to the cervical and dorsal enlargements of the cord to affect the trophic centers in the cord as the trophic nerves control the normal metabolism of the body. Although if the obstruction to the vaso-motor nerves of the gland has caused a degeneration of the gland, the blood will not be enabled to carry the vital secretion of the gland to its distributing point; and in consequence the stimulus to the trophic nerves of the gland will be lacking, its function is overcome, and in turn those parts of the body are effected which depend on the internal secretion of the gland. If the disease has developed to such an extent no help can be expected.

Whether the gland's secretions destroy certain poisonous substances produced in the muscular system, or whether their effect is in the metamorphosis of coloring matter, is not absolutely necessary to know in order to give an intelligent treatment.

DISEASES OF THE THYROID GLAND.

SIMPLE GOITRE.

Synonyms.—Struma; thyrocele; bronchocele; thick-neck.

A simple goitre begins as a true hypertrophy of the gland follicles, but finally certain peculiarities occur. Enlargement of the thyroid gland, except those due to exopthalmic goitre, inflammation, parasites, and malignant diseases are considered simple goitres.

The disease may occur in some localities endemically, but in this country it occurs sporadically.

The epidemic form has long been supposed to be due to some constituent of drinking water. What that constituent is no one has been able to find out.

Upon examination of patients with goitre lesions are

always found in the region of the middle and inferior cervical ganglia. Oftentimes the first rib or the clavicle is badly dislocated and obstructing the circulation of the thyroid region. Commonly, lesions of the cervical vertebrae are lateral or anterior, from the fourth to the seventh vertebrae respectively, involving the innervation of the thyroid gland.

The disease is much more common in women than in men. Occasionally congenital cases occur. The disease commonly develops after puberty. Straining during labor is occasionally a cause of goitre in the female.

Morbid Anatomy.—Anatomically, the varieties are (1) parenchymatous, in which there is true hypertrophy; (2) vascular, in which there is dilatation of the vessels; (3) cystic, in which there are large cysts. There may also be goitres characterized by calcareous infiltration, and amyloid changes.

Symptoms.—The entire gland, or one lobe, or the isthmus alone may be affected. Usually the goitre is of no inconvenience; the deformity being the objectionable feature. When the growth is large it may press upon the trachea causing dyspnoea, or upon the oesophagus causing difficult swallowing, or it may be beneath the strenum compressing the veins and causing swelling of the face and head. In one or two cases that I have seen the growth seemed to compress the vagi, according to the symptoms presented.

Treatment.—The treatment of goitres, osteopathically, has been highly successful. Many cases will be cured in a few treatments, still on the other hand some cases will require several months' treatment and then possibly the growth will not be lessened much in size. Probably, those cases in which there are enlarged and dilated vessels are the ones that yield to treatment so quickly. Simply re-

moving the pressure from the veins may be all that is necessary.

Besides correcting the clavicle and first rib and cervical vertebrae, treatment over the gland itself is a very helpful measure; but be very careful not to bruise the gland. The treatment over the gland is principally to relax the tissues about the enlargement.

MYXOEDEMA.

Treatment.—The treatment of myxoedema has not on the whole been very satisfactory. When the gland has become atrophied regeneration is almost impossible. A number of the cases that have been treated osteopathically presented very serious lesions of the cervical vertebrae. The treatment consists of an attempt to correct the cervical vertebrae and direct treatment of the gland.

EXOPHTHALMIC GOITRE.

Synonyms.—Struma exophthalmica; cardio-thyroid exophthalmos; tachycardia strumosa; Basedow's or Grave's disease.

Definition.—A disease characterized by palpitation with accelerated pulse, enlargement of the thyroid gland and protrusion of the eyeballs.

Etiology.—Usually found in women from the twentieth to the thirtieth year. Several members of the same family may be afflicted with this disease. Preceding the development of the disease may be fright, worry, shock, anaemia and depressing emotions.

Some authors classify exophthalmic goitre, primarily, a disease of the thyroid gland (hyperthyrea) in antithesis to myxoedema (anthyrea); others claim it is essentially a heart disease; and some a morbid crasis. I believe our knowledge of the disease would term it a pure neurosis of either the cervical sympathetic, or the cervical medulla spinalis

and the medulla oblongata. Injuries to the cervical vertebrae are generally found from the fourth cervical to the first dorsal affecting the middle and inferior ganglia of the cervical sympathetic. These ganglia contain nerve fibres to the blood vessels of the eyeballs and also nerve fibres to the thyroid gland and to the heart. Many diseases of the eyes resulting from disturbed innervation to the blood vessels of the eye-ball and orbit are due to lesions affecting the cervical sympathetic ganglia. The thyroid gland may become enlarged from lesions in the region of the lower cervical vertebrae and first rib; such lesions involve the middle and inferior cervical ganglia. Also, the heart's action, and in fact the entire vascular system may be functionally disturbed by lesions irritating the accelerator fibres of the cervical sympathetic.

Morbid Anatomy.—Structural changes are usually found in the fibres of the sympathetic nerves of the middle and inferior cervical ganglia. The protrusion of the eyeballs is due to development of fat in the posterior orbit which crowds the eyeball forward. In some cases there are atheromatous changes of the ophthalmic artery. Fatty degeneration of the eye muscle takes place owing to the disease and stretching of the muscles. The colloid material of the thyroid gland is replaced by mucinous fluid; there is an increased proliferation of its tubular spaces. These changes indicate an active evoluting process. The gland is enlarged by the dilatation of the blood vessels due to vaso-motor paralysis and in cases of long standing there is a serous infiltration.

Symptoms.—The development of the disease may occur suddenly but usually it is of slow origin. The first symptom usually noticed is cardiac palpitation, coupled with an accelerated pulse. The acceleration of the pulse may become so marked that it is noticed in the carotids, the

epigastric region, the retina and in some few cases the liver. Within a few weeks or months struma is developed. The goitre is soft and elastic involving the entire thyroid gland; although varying in size and subject to frequent changes. The blood vessels of the gland are greatly dilated and upon auscultation a thrill is heard.

Exophthalmos is the next prominent symptom. In a few cases the protrusion of the eyeballs appear before the enlargement of the thyroid gland. The degree of exophthalmos varies greatly, from a mere prominence to a dislocation of the eyeball. Both eyes are always affected, although sometimes more noticeable in one eye than in the other. Incoordination of the movements of the eyelids and the eye ball are present. Von Graefe observed "that the upper lid looses its power to move in harmony with the eyeball in the act of looking up or down." Owing to the eyeballs not being properly protected conjunctivitis may be present. Vision is unimpaired. Lachrymal secretion may be increased.

In connection with the above pathognomic symptoms are headache, nervousness, insomnia, vertigo, despondency, indigestion, increase of temperature, emaciation, anaemia and cough.

Diagnosis.—The diagnostic signs of exophthalmic goitre are enlarged thyroid, exophthalmos and a rapid action of the heart. It is in the incipient stage that one is liable to confound it with heart disease, phthisis, malaria or neurasthenia.

Prognosis.—The prognosis depends upon the progress the disease has made. Taken at the beginning in the first few months one can expect good results. Recovery has been made in severe cases of long standing. The progress is necessarily slow. The length of treatment varies according to the case. In cases of a few months' standing three

months' treatment will usually suffice; others take from six to eighteen months. Relapses may occur. Death occurs in many cases from disorders of circulation leading to a dilated heart.

Treatment.—The treatment is given primarily to correct the disorders of the cervical vertebrae. The upper dorsal vertebrae and upper ribs should be examined carefully for derangements. Lesions are usually found involving the middle and inferior ganglia of the cervical sympathetic, especially the inferior ganglion. A lesion obstructing or irritating these ganglia would disturb the normal activity of the thyroid gland, interfere with the action of the heart and affect the vaso-motor fibres of the head and arms. Involvement of the middle cervical ganglion would dilate the blood vessels back of the eyeballs and produce exophthalmos.

There may be an irritation at the first, second or third ribs causing an interference with the nerves to the heart. Also, an affection of the vagi would have some influence upon the heart's action either inhibitory or involving the vaso-motor fibres to the coronary arteries; besides a disorder of the vagi would affect the blood and nerve supply of the thyroid gland.

We should consider that the disease might be caused by reflex origin in a few cases; thus producing a simultaneous stimulation of the vaso-dilators of the thyroid gland, a stimulation of the motor fibres of Müller's muscles of the orbit and eyelids, as well as of the accelerans cordis; the same as a direct stimulation to the sympathetic fibres or of their spinal origins. The increased cardiac action or palpitation that is present may be caused by a diminished or arrested inhibitory action of the vagus. The phrenic nerve has some action upon the secretion of the thyroid gland.

Mental and physical rest is very necessary. Administer

an easily digestible and nutritious diet especially in anaemic cases. Lesions are oftentimes found in the medulla oblongata. I believe these are simply a sequence in most instances of the primary affection to the cervical spine and cervical sympathetic.

SECTION X.

DISEASES OF THE NERVOUS SYSTEM

DISEASES OF THE NERVES.

NEURITIS.

Definition.—An inflammation of the nerve fibres. It may be confined to a single nerve, localized, or general, involving a large number of nerves when it is known as multiple neuritis or poly-neuritis.

Etiology.—*Localized Neuritis.*—This may be due to: (1) exposure to cold, affecting most frequently the facial nerve. This is the so-called rheumatic neuritis. (2) Extension of inflammation from neighboring parts. (3) Traumatism—blows, wounds, compression, muscular contraction, excessive stretching such as occurs in fractures or dislocations.

Multiple Neuritis.—This may be due to: (1) Organic poisons, carbon bisulphide, ether and the metallic bodies, lead, mercury and arsenic. (2) Poisons, resulting from the infectious fevers—diphtheria, typhoid fever, small pox, scarlet fever, syphilis, malaria, etc. (3) Cachectic conditions, anaemia, carcinona. (4) Cases arise in which no definite cause can be found while others set in suddenly after exposure to cold or after over-exertion.

Morbid Anatomy.—The inflammation may chiefly involve the connective tissue surrounding the nerve—*peri-neuritis*—or it may pass into the deeper portion—*interstitial neuritis.* Parenchymatous neuritis is really a degeneration due to excessive or prolonged irritation or pressure which cut the nerves off from their center. An acutely inflamed nerve is red and swollen. In peri-neuritis there is an infiltration of the nerve sheath with leucocytes. In the interstitial form lymphoid cells accumulate between the nerve bundles.

In the parenchymatous form inflammatory signs are wanting. There is an increase in the nuclei of the sheath of Schwann. The white substance of Schwann becomes segmented, breaks up into drops and the axis cylinders break up into granules and both ultimately disappear,

while the interstitial connective tissue is but little altered. The muscles connected with the degenerated nerves also atrophy and in some cases the changes noted in the sheath of Schwann extend into the interstitial tissues of the muscles —the neuritis fascians of Eichhorst.

Symptoms.—*Localized Neuritis.*—There is not much constitutional disturbance in this form of neuritis. In the case of a sensory nerve there is severe pain of a boring or stabbing character, following the course of the affected nerve with tenderness from pressure. Weir Mitchell believes this is due to the irritation to the nervi nervorum.

Trophic symptoms such as glossiness of the skin and lusterless brittle nails arise in more chronic cases while in advanced cases there is wasting of the muscles. Sweating, herpes and occasionally effusion into the joints occur. When a motor nerve is principally affected muscular power is impaired, motion is painful and muscular twitchings will occur. Ultimately contractions, wastings of the muscles and even reactions of degeneration take place.

A rare form—the so-called ascending neuritis—in which the inflammation extends upward from the peripheral nerves to the larger nerve trunks or even the spinal cord resulting in myelitis. This occurs most commonly in traumatic neuritis.

The duration is very variable. Many acute cases pass off in a few days. Other cases may persist for months and even years.

Multiple Neuritis.—Inflammation involving several nerves affected simultaneously or in rapid succession.

Acute Form.—The attack may come on spontaneously or follow over-exertion or exposure to cold and wet. This form is characterized by a chill followed by a rapid rise in temperature which may reach 103 or 104 degrees F., headache, pains in the back and limbs. Loss of appetite,

constipation and sometimes intense pain in the nerves, also occur. Numbness and tingling are felt in the fingers and toes. There is loss of power especially in the legs and extensor muscles. The muscles atrophy. There is more or less anaesthesia and wrist drop and foot drop occur. The intercostal muscles may become paralyzed in such cases, the diaphragm alone may carry on respiration.

Recurring Multiple Neuritis.—A few cases have been observed in which attacks have recurred affecting the same nerves and producing a more or less wide spread paralysis each time.

Endemic Neuritis or Beri-beri.—This is a tropical disease and is wide-spread in China, Japan and parts of India. Intestinal parasites, over-crowding and a fish diet have all been thought to cause the disease. It is probably due to a micro-organism. In the acute form there is fever, anaemia, effusion in the serous cavities, general oedema and peripheral paralysis. In the chronic form there is loss of tendon reflexes, muscular atrophy, palpitation and shortness of breath. The gait is tottering and the face is generally puffy.

Alcoholic Neuritis.—This is the most common form. It occurs most frequently in women. It results from a moderate amount of spirit drinking continued over a long time. The onset is slow and may be preceded for some time by numbness and tingling in the fingers and toes. It is rarely febrile.

Loss of power soon becomes marked, first in the lower and then in the upper extremities. The extensor muscles are most affected, causing wrist and foot drop. Occasionally there is paraplegia alone while in rare cases the face and sphincters are involved. There are hyperaesthesia, tenderness and pain especially in the legs. The cutaneous reflexes are usually preserved and the deep reflexes as a

rule are lost. Delirium is common and hallucinations or illusions occur and may resemble to a certain degree those seen in general paralysis. The phenomenon may be those of delirium tremens or a peculiar condition described by Wilks in which the patient loses all appreciation of time and place and describes with minute details impossible journeys recently taken or tells of persons whom he imagines he has just seen.

Arsenic Neuritis.—This is not very common. It does not differ from the alcoholic form with the exception of the head symptoms which are usually absent.

In the Infectious Diseases.—Neuritis due to an attack of some infectious disease may be local or multiple. It is most common after diphtheria. The symptoms presented are those of neuritis due to any other cause. It is probably due to toxic materials absorbed into the blood.

Saturnine and carbon bisulphide neuritis is similar to arsenical neuritis.

Diagnosis.—There is rarely any difficulty in distinguishing neuritis. The gait is entirely different from locomotor ataxia, with which multiple neuritis is rarely confounded; while the absence of lightning pains, Argyll—Robertson pupil and the presence of the foot drop, paralysis, wasting and tenderness in neuritis will distinguish between the two.

Prognosis.—The prognosis is generally favorable.

Treatment.—It is very evident that the successful treatment of neuritis depends upon being able to ascertain the cause. Rest is important in all cases. Rarely has one any difficulty to locate the deranged structures that are predisposing to the attack; and usually a correction of these disturbances which are in the region involved will give immediate relief. All worrying of the patient should be stopped and in alcoholic cases the alcohol should be stopped as soon as possible. Hot applications will be of service in relieving

the pain, but usually as stated correcting the disturbance to the nerve fibres will be successful. Passive movements and massage are of service, but of course bear no comparison with specific osteopathic treatment. Relaxation of muscles along the spinal column and along the course of the nerve will at least give temporary relief.

SCIATICA.

Sciatica is usually a neuritis of the sciatic nerve, although all painful affections of the nerve are termed sciatica. In some cases it is a functional neurosis.

Etiology.—This affection occurs more frequently in males than in females. The usual period of life for sciatica is from the twentieth to the fiftieth year. The principal causes of sciatica are vertebral lesions of the lower dorsal and lumbar vertebrae, especially lesions to the fourth and fifth lumbar. Occasionally a subdislocated innominatum, a downward displacement of a floating rib or a partial dislocation of the femur are causes. Other causes are exposure to cold, contraction of muscles, gout, rheumatism and syphilis. In a few cases intra-pelvic causes are found, such as uterine and ovarian tumors, rectal accumulations and the foetal head during labor.

Symptoms.—Pain in the nerve along its course is the most constant symptom. The pain is most intense back of the thigh and above the hip-joint at the notch. The pain radiates downward through the entire distribution of the nerve; it is of an annoying character and walking is especially painful. In rare cases there is wasting of the muscles, cramps, herpes and oedema. In a few cases the neuritis may involve the spinal cord.

Diagnosis.—The diagnosis of sciatica is usually easy. Great care has to be taken in the examination to determine whether or not the affection is primary or secondary. It

may be quite difficult in some cases to locate the cause of disturbance especially if it is in the lumbar vertebrae as frequently a very slight deviation of a vertebra may cause the disease. Fecal accumulations in the rectum and pelvic tumors may cause sciatica. Hip-joint disease and sacro-iliac disease can generally be easily distinguished from this affection. The lightning pains of tabes may simulate sciatica but then there are other well defined symptoms of the disease.

Treatment.—Sciatica rarely runs a very long course, still there are cases that may last for years. The treatment is generally successful from the beginning.

The treatment almost wholly depends upon the cause. If the cause can be determined at once the probabilities are that severe cases may be relieved by a few treatments. Correction of the vertebrae to relieve impingements to nerve fibres, probably, as they pass through the intervertebral foramina, usually constitutes the primary treatment. Carefully examine the pelvic organs for disturbances, and occasionally deep treatment over the iliac vessels will be of great help. The innominata if deranged should be corrected and all troubles of the hip-joint that are found must be corrected.

Cases of rheumatism and gout should receive their separate treatments, besides careful manipulations of the affected leg. Rest in bed should be insisted upon. Treatment of the special points found deranged and a thorough treatment of the entire leg will be beneficial. Cold applied along the course of the nerves and an inhibitory treatment of the nerve back of the trochanter will at least give temporary relief. Placing a patient upon their back and flexing the leg and thigh upon the abdomen at the same time keeping the leg straight and the foot flexed is an effectual method to stretch the sciatica.

NEURALGIA.

Neuralgia means simply "nerve pain." The term neuralgia should be restricted to such nerve pains that are not caused by structural changes in the nerves. In cases where the pain is due to organic change in the nerves, the disease should not be classed as a neuralgia.

Etiology.—Neuralgia is essentially a disease of adults. It rarely occurs before puberty or late in life. Women are more prone to neuralgia than men. The tendency to neuralgia may oftentimes be hereditary. Sufferers from neuralgia often present a peculiar "nervous temperament."

The exciting causes of neuralgia are impairment of general health; irritations of the nerve fibre or trunk, by a disordered bone, ligament or muscle which may affect the nervous tissue directly by mechanical irritation; or indirectly by the disturbance of its blood supply or chemical irritations due to the disturbed circulation; exposure to cold or damp; overwork and worry; toxic influences of various diseases, as malaria, lead poisoning and alcoholism; simple irritation from carious teeth.

Symptoms.—Pain is the most prominent symptom which is spontaneous and paroxysmal; it may be described as "darting," "shooting," "burning," "stabbing," "boring," etc. The pain is usually unilateral following the course of the sensory nerves and there is generally tender points along the course of the nerve. Especially are there points of tenderness near the central end of the nerve where the displaced structures are irritating it. After the pain has continued for some time the skin becomes tender, reddened and swollen. The redness and oedema are supposed to be due to vaso-motor changes. Muscular spasms, trophic disturbances, skin eruptions, herpes and grayness of the hair are of rare occurrence. The duration of an attack varies from a number of minutes to a few hours.

VARIETIES ACCORDING TO NERVES INVOLVED—NEURALGIA OF THE FIFTH NERVE.

Synonyms.—Trifacial or trigeminal neuralgia; Fothergill's disease; neuralgia of the fifth pair; tic douloureux; prosopalgia.

This is by far the most frequent variety of neuralgia, and it is generally due to a displaced atlas or inferior maxillary. All the branches of the fifth nerve is rarely involved. The ophthalmic division is most often affected; pain and tenderness being present about the supra-orbital notch or foramen, the palpebral branch at the outer part of the eyelid, the nasal branch and occasionally an ocular pain will be felt within the eyeball. When the infra-orbital branch is involved, pain and tenderness is principally present at the infra-orbital, nasal and malar points. When the third division is affected, the chief tender points are the inferior dental, temporal and parietal points. In nearly all cases of neuralgia of the fifth nerve there is extreme soreness and tenderness, in the region of the articulation of the atlas and the occipital, particularly the side on which the fifth nerve is involved. This tenderness in a few cases may be found as low as the second or third cervical vertebra. The pain may be so severe as to cause oedema along the course of the affected nerve fibres, grayness of the eyebrows and locks of hair; chiefly in the temporal region and convulsive twitching of muscles.

CERVICO-OCCIPITAL NEURALGIA.

This variety involves the posterior branches of the first four cervical nerves, affecting the region of the posterior part of the neck and head. The pain may extend as far forward as the parietal eminence and the ear. The chief tender points are about midway between the mastoid process and the spine, between the sterno-mastoid and trape-

zius (branches of the cervical plexus) and a point just above the parietal eminence. This form of neuralgia is chiefly due to subluxations of the upper four or five cervical vertebrae; thus irritating the posterior branches of the spinal nerves. A draught of air or exposure to cold, are common causes. The pain is of a sharp lancinating nature or else it is heavy and tense.

CERVICO-BRACHIAL AND BRACHIAL NEURALGIA.

In these forms of neuralgia the pain is referred to the area supplied by the four lower cervical and the first dorsal nerves. The tender points are the axillary along the course of the ulnar, the circumflex at the posterior part of the deltoid and points at the lower and posterior part of the neck. The lesions exciting this form of neuralgia are usually found in the upper dorsal and upper cervical spines but they may be as low as the sixth dorsal or as high as the atlas. As far as neuralgia of the ulnar nerve alone is concerned the lesion is generally found at the fifth vertebra or rib. How a lesion as low as the fifth dorsal would affect the ulnar nerve I am unable to say definitely. There may be fibres directly to the ulnar nerve as low as this region. The nerve may be reflexly affected. The vaso-motor supply to the ulnar nerve may be affected; or possibly a lesion at the fifth dorsal would interfere with fibres of the deep layers of the back muscles, and thus contraction of muscles for some distance above the lesion would affect the fifth and other nerves.

TRUNK NEURALGIA.

This includes dorso-intercostal and lumbo-abdominal neuralgias. In the former, *dorso-intercostal neuralgia*, occupies the intercostal nerves from the third to ninth dorsals, and is characterized by pain along the intercostal spaces; or in parts of them. The pain may be bi-lateral and symmetrical

which usually shows a vertebral lesion. Three points of tenderness are usually noted, viz., near the vertebrae, near the median line in front, and midway between these two points in the mid-axillary line. The pain is usually dull with acute exacerbations. Lesions of the vertebrae and ribs in the locality affected; are by far the principal causes. Cold exposure, strains, etc., are exciting causes of every-day occurrence. When the pain is bilateral and symmetrical the lesion is usually in the vertebra; when uninlateral the rib alone is generally involved. The most common lesion is a crowding together of the ribs anteriorly at the fifth and sixth interspace.

The pain of herpes zoster is not neuralgiac, but neuritic. Peulrodynia, strictly speaking, is neuralgia of the pleural nerves, and not of the intercostals, but a dislocated rib over the region of the pain is commonly the cause of the pleurodynia.

Lumbo-abdominal neuralgia involves the posterior branches of the lumbar nerves. Tender points are found near the vertebrae, middle of the iliac crest, lower part of the rectus, and in the male occasionally in the scrotum, in the female in the labia. These are often bilateral and are usually of a constricting nature. The ilio-scrotal branch is the one most commonly affected.

Subluxations of the vertebrae, and other lesions as contracted muscles are found along the lumbar vertebrae, and even as high as the lower dorsal vertebrae. Also lesions are found at the lumbo-sacral and ilio-sacral articulation.

A downward displacement of the lower ribs, eleventh and twelfth, is a common disorder and may be the cause of severe neuralgiac pains in the region of the iliac fossae. It may simulate ovarian inflammation, renal colic or even appendicitis, if on the right side. In fact it may be a cause of

inflammation of the deeper structures, such as the ovary and Fallopian tube.

A subluxation of the vertebrae at the fourth and fifth dorsals may cause severe neuralgiac pains in the epigastrium.

NEURALGIA OF THE SPINAL COLUMN.

According to medical writers this is especially found in weakly women and after concussion of the spine; that it is a troublesome symptom in hysteria and that in some cases it is due to a reflex stimulus from diseased viscera. Most of this is undoubtedly true but they have not found out the real significance of these neuralgiac pains. The various tender points along the spinal column, are of paramount importance to the osteopathic physician, as a guide to his diagnosis, not only in certain cases but in nearly every case. The tender points are not due to reflex stimuli in nearly every instance from diseased organs but these tender points are the result of a local lesion and are many times the cause of the disorder to the diseased viscus. The neuralgiac pains are simply a symptom that a lesion exists in the immediate locality.

NEURALGIA OF THE SACRAL REGION AND COCCYGODYNIA.

This form involves the nerves in the sacral and cocygeal regions. The nerves between the bone and skin are affected. The cause of the pain is generally due to derangement of the articulation of the lumbar and sacrum, and to severely contracted muscles over the sacral foramina. In coccygeal neuralgia the coccyx is commonly displaced in any one of the various displacements that are liable to occur.

NEURALGIA OF THE LEGS AND FEET.

This includes the crural form in which the front of the thigh is the seat of the pain. Also the form in which ten-

der points are found along the course of the sciatic nerve. The latter form is quite a common one, although sciatica is rarely a neuralgia. It is a neuritis and will be found classed under that heading. The tender points presented are the lumbar, sacro-iliac, gluteal, peroneal, maleolar and external plantar. The various neuralgiac pains of the legs and feet are generally due to lesions of the lumbar, pelvic and thigh regions.

VISCERAL NEURALGIA.

This is a term applied to neuralgia of the gastro-intestinal tract, the kidneys, and the various pelvic organs.

Neuralgias are also classified according to their character and cause as epileptiform, reflex or sympathetic, traumatic, herpetic, hysterical, rheumatic, gouty, diabetic, anaemic, malarial, syphilitic and degenerative neuralgia.

Diagnosis.—Neuralgia is to be diagnosed chiefly from neuritis, rheumatism, and the effects of pressure upon nerves. In neuritis there is oftentimes a symmetrical affection while in neuralgia there is a unilateral distribution and there are many remissions and intermissions and a varying of the pain from one place to another. In severe forms of neuritis; anaesthesia succeeds the hyperaesthesia of the sensory nerves. In cases of pressure upon nerves the pain is continuous and neuritis will soon be manifested.

In rheumatism, the pain is localized in muscles or groups of muscles and does not follow the course of the nerve. The pain is increased by motion.

Prognosis.—Is generally favorable, no matter how severe the attack. The prognosis is influenced only by the age of the patient and the cause.

Treatment.—Consists, first, in the control of the paroxysm and, second, in the removal of its cause. In controlling the paroxysm; frequently one will be able to remove the cause.

In the large majority of neuralgias the cause is directly due to a displaced tissue, generally a bone or muscle in the locality affected; all that is necessary in order to perform a cure is to correct the disordered tissue and the pain ceases. This usually can be done immediately, although there are cases which require a course of treatments before a correction of the parts can be accomplished; besides in acute cases the involved region will be so tender that an attempt to correct the tissues sufficiently to relieve the paroxysm will be unbearable to the patient. In such instances when the cause cannot be removed at once, firm pressure or inhibition over the involved nerves for a few minutes, and local application of hot water, will generally disperse the pain for the time being. The laws of hygiene should be observed in all cases.

The best time to remove the cause of neuralgia is between the attacks when the tissues are not as tender; or contracted to such an extent as during the paroxysm. A diagnosis can then be made much more easily, and the tissues corrected with less pain to the patient.

The details—as to the locality treated—for each form of neuralgia; will be found under the discussion of each variety.

DISEASES OF THE CRANIAL NERVES—OLFACTORY NERVE.

The olfactory nerve may be affected at various points from its origin to distribution. The disturbances may produce hyperosmia, parosmia or anosmia. The lesions may be tumors, injuries to the head and various diseases of the brain; or diseases of the nasal mucous membrane.

The treatment of the nerve outside of treating the disease causing the disturbance can be given only—as far as I know—to the cervical region with a view to control the blood supply.

OPTIC NERVE AND TRACT.

The retina, optic nerve, chiasm and optic tract may be affected by various lesions.

The affections of the retina are organic or functional. Under organic there is haemorrhage and retinitis. Under functional or toxic and hysterical amaurosis, tobacco amblyopia, nyctalopia, hemeralopia and retinal hyperaesthesia.

Included in the lesions of the optic nerve, are optic neuritis and optic atrophy.

Under lesions of the chiasm and tract are diseases of the chiasm and unilateral regions of the tract. Lesions of the tract and centers may be found in the tract itself, in the optic thalamus and the tubercula quadrigemina, in the fibres of the optic radiation, in the cuneus, and in the angular gyrus.

I have given a brief summary, only, of the lesions found, it being the idea not to dwell upon symptoms, morbid conditions, etc., but to bring out essential osteopathic features in regard to the cranial nerves. For the various effects of these lesions, and points of diagnosis the reader is referred to the various practices of medicine.

Lesions peculiar to osteopathic practice, that affect the optic nerve and tract, are found chiefly in the upper and middle cervical vertebrae. The disorders to these vertebrae may involve fibres of the optic nerve directly, those that are claimed to originate in the cervical spine; they involve the retina and optic nerve by way of the fifth, as claimed by some; and these lesions especially affect the blood supply to the optic nerve and tract, either interfering mechanically with the blood vessels; or obstructing and irritating vasomotor nerves. The most common lesions are sub-dislocations, of one, or of all of the three upper cervical vertebrae.

Still lesions may be located as low as the third or fourth dorsal vertebra, which may influence vaso-motor and sympathetic nerves, or the lymphatics. The three or four upper ribs should also receive due consideration.

MOTOR OCULI.

Lesions of the third nerve may affect its center or the course of the nerve. These lesions produce spasms or paralysis.

The only way that we can control the motor oculi is by way of the superior cervical sympathetic; also, it has a connection with the fourth, fifth and sixth nerves, and we can influence it to some extent by direct treatment to the eyeball and orbital muscles. It should be remembered by the osteopath that many of the lesions found affecting the cranial nerves, upon the post mortem examination, are the effect of lesions in the spinal region; that the real lesion is the disordered anatomical spinal tissues, as for instance in the third nerve, derangements of the atlas; or axis may affect the nerve sympathetically (reflexly), or possibly by direct fibres, and produce the secondary effect—the so-called primary lesions, by other schools, at the center or in course of the nerve.

PATHETICUS.

This nerve may be involved by tumors at its nucleus, or as it passes around the outer surface of the crus into the orbit. Aneurisms or the exudation of vascular meningitis may also compress its fibres. This nerve is purely motor, although it receives a few recurrent sensory fibres from the fifth nerve.

This nerve is controlled osteopathically, principally, at the superior cervical sympathetic. It has connections with the sympathetic by way of the cavernous plexus.

TRIGEMINUS.

Lesions of this nerve are found in its nucleus and in the pons, especially sclerosis, haemorrhage, disease and injury at the base of the skull, tumors, aneurisms, inflammation of the nerve, and subdislocations of the upper three cervical vertebrae, or the inferior maxillary.

This nerve is an extremely important one from an osteopathic point of view; as it has a vaso-motor influence over various vessels of the head, face and secretory fibres to the lachrymal, parotid and submaxillary glands; also, it controls mastication, and to some extent deglutition, and influences hearing (tensor tympanum muscle). Diseases of the nasal mucous membrane and disease of the anterior portion of the eyeballs; are largely due to the vertebral subdislocations and to derangements to the inferior maxillary. For the facial points of treatment see neuralgia of the fifth nerve; although our principal work upon this nerve is at the upper cervical vertebrae, the inferior maxillary, and the deeply contracted muscles in the upper cervical region. This nerve is closely related to the 6, 7, 8, 9, 10, 11 and 12 nerves. I wish to emphasize the importance of treating this nerve in nasal catarrh, and in eye diseases, of the anterior portion of the eye ball. It contains trophic fibres to the eye, sensory fibres to the sclerotic coat and iris, and vaso motor fibres to the choroid plexus.

ABDUCENS.

This nerve is especially liable to be affected by tumors and meningitis. It is controlled osteopathically at the superior cervical sympathetic, being connected with the sympathetic at the cavernous plexus.

FACIAL.

Lesions may occur in the cortical centers of the nerve, the nucleus and the nerve trunk. Paralysis of the facial nerve,

occasionally occurs (Bell's paralysis); also facial spasm may occur. This nerve is controlled at the stylo-mastoid foramen. Lesions to the atlas, anteriorly or laterally, are commonly found. In the region of the stylo-mastoid foramen the nerve communicates with the great auricular of the cervical plexus, the trifacial, the vagi, the glosso pharyngeal and the carotid plexus of the sympathetic. The facial nerve may be affected directly as it passes above the angle of the jaw.

AUDITORY.

Lesions may occur affecting this nerve anywhere from its cortical center to its distribution in the cochlea and vestibule. Disorders resulting from lesions from this nerve are nervous deafness, auditory hyperaesthesia, tinnitus aurium, and Meniere's disease.

The control of this nerve, and the treatment of lesions affecting it, is effected principally at the first and second cervical vertebrae. The atlas is especially apt to be subdislocated anteriorly, or in a rotary manner. The condition of the upper dorsal region should also be carefully examined as vaso-motor nerves to the ear may be impinged at that point. The auditory connects with the fifth, sixth and seventh nerves.

GLOSSO PHARYNGEAL.

This nerve may be affected by tumors, degenerations, meningitis and various lesions. It is often very hard to determine exactly the pathology on account of its various connections with other nerves as the vagi, facial, spinal accessory, olfactory and optic nerves.

This nerve is chiefly controlled at its exit at the jugular foramen. Osteopathically, lesions of the cervical vertebrae and upper dorsal vertebrae affect it. The deep muscles of the anterior and lateral regions of the neck and subdislocations of the atlas especially affect this nerve.

PNEUMOGASTRIC.

On account of its extensive distribution, and the importance of its functions; this is one of the most important nerves in the body. It distributes fibres to five vital organs —heart, lungs, stomach, liver and intestines, and to other organs of secondary importance. This nerve is associated with deglutition, phonation, respiration, circulation and digestion.

Haemorrhages, softening, etc., may involve the nucleus of the nerve; while the trunk of the nerve may be impinged by tumors, thickened meninges, aneurism of the vertebral artery, and subdislocations of the upper six or seven cervical vertebrae, chiefly the atlas.

The nerve is easiest controlled at its exit from the foramen. Inhibition of the suboccipital region; between the mastoid process and transverse process of the atlas; will influence the nerve markedly, probably reflexly; and direct treatment of the nerve as it passes along the anterior part of the neck near the trachea. The superior laryngeal branch may be treated below the great cornu of the hyoid bone; the inferior laryngeal, at the inner side of the lower part of the sterno-cleido-mastoid muscle. The inferior laryngeal nerve may be affected by dislocation of the first and second ribs, producing pressure upon the nerve as it winds about the subclavian vessel. Fibres of the nerve have been traced to the spinal accessory nerve, as low as the sixth and seventh cervical vertebrae, consequently lesions to the vagi nerves may occur anywhere in the cervical region.

SPINAL ACCESSORY.

Lesions of this nerve may cause paralysis or spasm of its branches. The lesions consist of subdislocations of cervical vertebrae, chiefly the upper three or four; the nucleus may be involved by wounds, abscesses, caries of the vertebrae, tumors and meningitis; these lesions may, also, involve fibres of the trunk.

The special points of control of this nerve, are at the jugular foramen, the sixth and seventh cervicals and the second, third and fourth cervicals.

HYPOGLOSSAL.

This nerve may be affected by cortical, nuclear and infra-nuclear diseases, as well as by subdislocations of the upper cervical vertebrae. It communicates with the superior cervical ganglion, the vagi, the upper cervical nerves and the gustatory branch of the fifth nerve. We control the nerve at the anterior condyloid foramen, and at the superior cervical ganglion.

DISEASES OF THE SPINAL NERVES. CERVICAL NERVES.

Occipital Nerves.—The great occipital nerve may be controlled at a point on the occiput; between the mastoid process and the first cervical vertebrae. The small occipital, and the great auricular nerves; may be controlled at a point just behind the mastoid process. The great auricular nerve and the frontal branch of the trigeminus nerve meet over the parietal protuberance. The preceding points are the places where one may inhibit these nerves, and control a headache or neuralgiac attack, although subdislocations of the upper cervical vertebrae, or contracted muscles between the atlas and occiput are usually the cause of such disturbances; hence a correction of the lesion will cure the disturbance.

Treatment of the upper cervical region, by relaxing muscles and correcting deranged vertebrae, constitute the principal treatment of an ordinary *headache.* It is best to have the patient flat upon the back and the physician to stand at the head of the patient, and, first, thoroughly relax these contracted muscles or correct the disturbance of the vertebrae; then after the foregoing has been accomplished, an in-

hibitory treatment of the suboccipital region is given. In inhibiting place the fingers over the contracted and tender tissue; hold tightly for several minutes, or at least until the tissues have thoroughly relaxed. Many times one will be able to detect a slight twitching underneath the fingers, and when such is felt, he knows at once that the headache is relieved. In inhibiting at any point along the spine seek the contracted fibres and tender points and inhibit exactly over that area. Headaches that are due to a disturbed circulation of the brain, may be relieved by this inhibitory treatment in the suboccipital region. This treatment certainly re-establishes a normal circulation of the brain. Headaches may also be due to lesions at various points along the spine and ribs, and a correction of such points is necessary in order to cure the affection. A place often found involved is the upper dorsal region. Reflex headaches can be cured only by relieving the irritation. The treatment to the head would only be temporary.

Phrenic Nerve.—Lesions to this nerve usually occur in the region of the third, fourth and fifth cervical vertebrae. The lesion may be due to a deranged vertebra; or to disease of the membrane of the cord, or of the anterior horn of the gray matter.

The treatment of *hiccoughs* is inhibition, or better still, if possible, a correction of the deranged tissues, when such exist, at the third, fourth and fifth cervicals. Also, pressure of the nerve at the supra-clavicular fossa, at the anterior insertion of the diaphragm between the 7th and 10th ribs, at the cartilage of the third rib, and in some cases at a point just above and back of the mastoid process, and at the second lumbar. In a few cases hiccoughs may be stopped by forced protrusion of the tongue; this probably inhibits the nerve connection between the hypoglossal and phrenic when such exists.

Various diseases of the phrenic nerve are principally treated in the area of the origin of the phrenic nerve.

Musculo-cutaneous Nerve.—In obstructions to this nerve the power to flex the fore-arm upon the arm is greatly impaired. The lesion is most likely to be found between the fifth and sixth cervical vertebrae.

Median Nerve.—Clinically, this is of special interest from the fact that atrophy of the muscles of the bone of the thumb, which is pathognomic of progressive muscular atrophy, may be caused by an affection of this nerve. The lesion is usually from the third to the seventh cervical vertebrae.

Ulnar Nerve.—Lesions of this nerve may arise between the sixth and seventh cervical vertebrae, but are oftentimes found as low as the fifth dorsal, especially at the fifth rib on the side affected.

Circumflex Nerve.—Lesions of this nerve may be found in the lower cervical vertebrae but are commonly caused by dislocations of the humerus and clavicle.

Suprascapular Nerve.—Lesions of this nerve occur most frequently from the fifth to sixth cervical vertebrae inclusive.

DORSAL NERVES.

The essential osteopathic points of the dorsal nerves have been considered under intercostal neuralgia. It might be stated that the posterior fibres of the sixth, and seventh dorsal nerves supply the skin of the pit of the stomach. This is of value, clinically, as severe pains in the epigastric region which may be due to impingement of these nerves, is supposed by the patient to be due to the stomach.

The diseases of the liver may be manifested by pains in the region of the right scapula. It has been suggested that the stimulus passes up the pneumogastric; from the liver to

the spinal accessory and down the spinal accessory to the trapezius muscle and thus cause the "liver pain."

Intercostal neuralgia is more common upon the left side of the body. The intercostal veins of the left side empty into the left superior intercostal vein; or the left vena azygos. Thus the blood in reaching the vena cava is obliged to take a circuitous route and stagnation is more likely to occur than on the other side.

The glandular structure of the mammary glands are supplied by intercostal nerves from the third to sixth interspaces.

LUMBAR NERVES.

The lumbar nerves may not only be deranged by various growths, inflammatory processes and abscesses in the abdomen, but by lesions of the lumbar vertebrae.

Lesions in the region of the first lumbar may affect the *ilio hypogastric* and *ilio inguinal* nerves and cause various irritations of the penis, scrotum, labium and thigh. Also, the perineal region may be involved as well as connecting branches of these nerves to various visceral nerves underneath.

The genital organs may be affected by lesions to the *genito-crural* and *external cutaneous* nerves caused by vertebral lesions of the second and third lumbar vertebrae.

Lesions at the third and fourth lumbar vertebrae and sacro-iliac articulation may affect the *obturator* nerve.

SACRAL NERVES.

Lesions to the sacral nerves are specially liable to occur; when an innominatum is subdislocated, as that would change the relative position of the femur with the body and cause impingement to the sacral nerves; by contraction of the pelvic and thigh muscles. Other lesions to the sacral nerves may be located at the fifth lumbar and sacrum. It

should be remembered that the centers for the sacral nerves, are in the lower dorsal and upper lumbar region. Various lesions to the sacral nerves may be caused by pelvic inflammation, compression by growths, and injuries and contraction of muscles within the pelvis.

DISEASES OF THE SPINAL CORD.

ACUTE MYELITIS.

Synonyms.—Myelitis; diffuse myelitis; transverse myelitis.

Definition.—An acute inflammation with softening of the substance of the cord; giving rise to marked disturbances of motion, sensation and nutrition.

When the whole thickness of the cord is involved in a small vertical extent the condition is termed *transverse myelitis*. When an extensive area is involved it is termed *diffuse myelitis*. When the gray matter around the central canal is especially affected it is termed *central myelitis*.

Etiology.—It may follow repeated exposure to wet, cold or exertion; also, as a sequel to the infectious diseases, as small pox, typhoid fever, typhus, puerperal fever or measles. It may be due to traumatism or disease of the vertebrae as caries or cancer. Syphilis and tumors are also said to cause it. Sometimes there is a hereditary tendency to the disease. It is most common in males between fifteen and thirty years of age.

Morbid Anatomy.—To the untrained naked eye, the cord may present little or no change. On section the substance of the cord is red and soft, the line of demarcation between the gray and white matter is lost; or extremely indictinct, and minute haemorrhages are sometimes seen. In very acute cases, affecting the white and gray matter, after injury, when the membranes are cut the substance of the cord may flow out as a reddish creamy fluid.

The nerve fibres are much swollen, the axis cylinders break up and disappear, and corpora amylacea may be present. Blood discs, leucocytes, and numerous granular fatty cells may also be present. The blood vessels are distended and dilated. There may be thickening and hyaline degeneration of the vessel walls and haemorrhagic extravasation.

Symptoms—*Acute Transverse Myelitis.*—This is the type most frequently met with. The symptoms differ with the situation of the lesion, which is generally in the dorsal cord. At the onset there may be pain; numbness and tingling in the back, radiating into the limbs. There is usually moderate fever, malaise, chills, muscular pains, a coated tongue and constipation. Symptoms of motor paralysis soon develop which may become more or less complete. The reflexes are lost at first. They soon return and are exaggerated below the lesion. This often causes the muscles to become rigid and contracted. Unless the lesion is in the lumbar or cervical cord reaction of degeneration or wasting of the muscles as a rule does not occur. A girdle sensation frequently occurs at the level of the disease. At first there is retention of the urine and faeces, later incontinence. Bed-sores soon develop, also drying and hardening of the skin. The nails become thick and brittle. Death may occur from exhaustion or heart or respiratory failure. Recovery is rare; segments of the cord may be completely and permanently destroyed, causing persistent paraplegia.

Acute Central Myelitis.—In the most acute forms the course of the disease is quite rapid. The trophic disturbances are more marked than in the former type. This form is apt to follow exposure to cold, injuries, tumors, syphilis or one of the infectious diseases. There may be chills, fever, malaise, pain in the back and limbs, and occasionally convulsions. The reflexes are generally lost. The motor functions are rapidly lost. There is incontinence of urine and faeces, rapid

wasting of the muscles and bed-sores develop rapidly. The disease generally proves fatal in from six to ten days.

Diagnosis.—*Landry's Disease.*—In this the bladder and rectum are not affected. Trophic disturbances are absent. There is but slight loss of sensation.

Multiple Neuritis.—There are never trophic changes. The bladder and rectum are rarely involved. The girdle pain is absent.

Acute Poliomyelitis.—There are no sensory symptoms and the rectum and bladder are not affected.

Prognosis.—In very acute cases death occurs in from three to ten days. Milder cases generally recover with more or less loss of motor power.

Treatment.—Lesions of the vertebrae are usually readily found in cases of myelitis. Generally, deranged vertebrae are found in the upper dorsal region, and occasionally lesions are located in the lumbar and cervical vertebrae. The treatment of myelitis is chiefly to correct these lesions; so that the normal circulation of the cord may be re-established. One has to be very careful when treating the lesions not to cause additional injury to the cord. An inhibitory treatment to the muscles about the lesion may be all the treatment that can be given at first, nevertheless it aids nature just so much in overcoming the excessive irritation of the cord tissues. Nature has the curative means, provided they may operate unobstructedly. In a few cases the ribs in the region of the spinal lesion will be found deranged and interfering with trophic fibres, blood vessels and lymph vessels of the cord.

Warm baths and massage will be found of additional value. Enemata should be used in emptying the bowels and if a catheter is necessary to empty the bladder it may be found preferable to keep a soft one permanently in the bladder.

ANTERIOR POLIOMYELITIS.

Synonyms.—Atrophic spinal paralysis; myelitis of the anterior horn; infantile paralysis.

Definition.—An acute disease occurring most commonly in young children; characterized by paralysis, rapid wasting of certain muscles and fever.

Etiology.—It occurs usually in children under three years of age and is more common in summer than in winter. The cause of the disease in unknown. Traumatism, exposure to cold and over-exertion, are probably predisposing causes. It has occurred in epidemic form and is most probably of infectious origin.

Morbid Anatomy.—The disease is most frequently seen in either the lumbar or cervical enlargement. In very early cases the condition of acute haemorrhagic myelitis with degeneration and rapid destruction of the large ganglion cells has been found. In old cases the anterior cornu in the affected region is atrophied and there is destruction of the multipolar ganglion cells. The anterior nerve roots of the same side are atrophied; the muscles are wasted, undergoing a fatty and sclerotic change.

Symptoms.—The child may have a slight fever, malaise, muscular twitching, headache and sometimes vomiting. This may last a day or two or only a few hours when paralysis sets in abruptly involving a greater or less area. The paralysis is rarely complete and groups of muscles only may be affected. As a rule the paralysis comes on abruptly, but it may come on slowly taking from three to five days to develop. In a few weeks atrophy sets in and the limb becomes flaccid, soft and wasted. The paralysis remains stationary for a time when improvement takes place but complete recovery is rare. Sometimes the growth of the bone of the affected limb is impaired. There are no sensory disturbances and the bladder and rectum are not affected.

Diagnosis.—This is not difficult. Careful study of the case is all that is necessary.

Prognosis.—Complete recovery is rare. Improvement is the rule.

Treatment.—In all cases of spinal disease a thorough treatment should be given. One is not justified at any stage of the disease to stop the treatment. It should be remembered that osteopathic treatment has been successful in diseases that are oftentimes considered hopeless and incurable by practitioners of other schools. It is impossible to tell how much can be done for a case until an attempt is made. In the various diseases of the spinal cord careful and thorough treatment should always be given with a view of correcting abnormal deviations of the vertebrae and ribs, and to separate each vertebra and relax the muscles thoroughly, to relieve impingements of nerve centers and nerves and to influence the circulation of the cord. Of course it is impossible to regenerate nerve centers that have been destroyed, still one cannot always tell when nerve tissues have been entirely destroyed.

In the regions of the cervical and lumbar enlargements of the cord special care should be taken that the spinal column is thoroughly treated. Rest in bed is necessary and the ordinary fever and bowel treatments should be given. Massage and baths will also be found a helpful measure in maintaining the nutrition of the muscles.

ACUTE ASCENDING SPINAL PARALYSIS.

Synonym.—Landry's paralysis.

Definition.—An acute disease characterized by an advancing paralysis beginning in the legs, passing upward to the trunk and arms and finally it may involve the muscles of respiration.

Etiology.—No definite cause is known. A toxic cause seems probable. The disease is most common in males between twenty and thirty years of age. It may follow troumatism, exposure, cold or the infectious fevers.

Morbid Anatomy.—No definite lesions have been found.

Symptoms.—Weakness of the lower extremities is generally the first symptom. This is shortly followed by paralysis. The paralysis then extends to the trunk and within a few days the arms are also affected. The muscles of the neck are next involved and finally those of respiration, deglutition and articulation. The reflexes are abolished. The muscles are relaxed but do not waste or show electrical changes. Sensation is usually not affected, but there may be tingling, numbness, hyperaesthesia and muscular tenderness. The sphincters are not involved as a rule. In some cases the spleen has been found to be enlarged.

Course.—This is variable. Death may occur in from forty-eight hours to a few weeks. Recovery has occurred in rare instances. When improvement takes place the part last affected recovers first.

Diagnosis.—This is not always easy. It is sometimes impossible to differentiate between this disease and multiple neuritis, especially in cases in which sensation is involved in Landry's disease. The rapidly advancing motor paralysis, the absence of wasting and of electrical changes, as well as the absence of involvement of the sphincters will serve to distinguish it from other affections.

Prognosis.—The prognosis is unfavorable. A large majority of cases prove fatal.

Treatment.—The treatment of Landry's disease consists principally of thorough treatment of the spine, especially of the lower dorsal and lumbar regions. The treatment should be most thorough, the vertebrae and ribs found disordered should be corrected and each vertebra should be separated

from its neighbor. When the paralysis has extended to the trunk and neck a thorough treatment all along the spinal column should be given with a view of relaxing the contracted muscles and to render flexible the entire spinal column, so that the cord may be properly nourished and the progress of the disease checked. Treatment of the limbs directly will be found a help as well as direct treatment of all tissues paralyzed. If swallowing is difficult the patient should be fed through the rectum.

SPASTIC PARAPLEGIA.

Synonyms.—Anterio-lateral sclerosis; primary lateral sclerosis; spastic spinal paralysis.

Definition.—A disease of the spinal cord characterized by loss of power, spasm of the muscles of the lower extremities, increased reflexes and a peculiar gait.

The chief varieties are:

PRIMARY LATERAL SCLEROSIS.

It is a question whether a primary lesion of the lateral tracts ever takes place, or whether this is not always combined with some lesion in the anterior horn affecting the motor cells.

Etiology.—It generally occurs between the ages of twenty-five and forty. The disease occurs most frequently when there is a neuropathic family tendency. Traumatism, exposure, acute diseases and syphilis are predisposing causes.

Symptoms.—The onset is usually slow. Loss of power is generally the first symptom. In other cases there may be no definite loss of power. The patient complains of feeling tired; there may be dull aching pains in the back or in the calves and the legs are stiff. Loss of power begins in the lower extremities and increases very slowly. The knee jerk is increased and in most cases the rectus clonus and the ankle clonus are easily obtained. The rigidity of the muscles

is present even at an early stage especially when the limb is extended. Later this becomes a prominent symptom and in some cases this rigidity is so marked that the patient loses the power of walking. As the disease develops the gait becomes characteristic. The legs are more stiff and the knees are drawn together while the toes scrape the ground. The spasm of the adductors of the thigh may be so extreme that the legs can only be separated with great difficulty and in some instances actually over-lap in walking. The muscles do not waste. The nutrition is well maintained and the muscles tend to become hypertrophied. The sphincters are rarely involved. The arms may be unaffected for years, but finally loss of power and rigidity may develop. The duration is indefinite.

Diagnosis.—This is not difficult. A history of syphilis is present in a number of cases. In many instances the lesions are well marked.

Prognosis.—In some cases the disease may be arrested and a few have recovered by persistent osteopathic treatment.

SECONDARY SPASTIC PARALYSIS.

Following a transverse lesion of the cord whether the result of tumor, myelitis, sclerosis or caries, degeneration of the pyramidal tracts takes place below the point of disease and as a result the legs are weak. There is more or less rigidity and the reflexes are increased. As Bastian has shown in certain cases the limbs may be flaccid while the reflexes are not increased.

SPASTIC PARAPLEGIA OF INFANTS.

(Paraplegia Cerebralis Spastica).

This is often the result of premature delivery or difficult labor. Generally the child is several months old when it is noticed that the legs of the child are stiff. When the child

tries to walk the stiffness and awkwardness are marked. Sensation is unimpaired and the bladder and rectum are not implicated.

Symptoms.—These are almost identical with those of spastic paraplegia of adults. The disease is probably due to meningeal haemorrhage. In some cases cerebral development is impaired resulting in idiocy and imbecility. The arms may be involved—spastic diaplegia. Some authors describe what they believe to be a hereditary form of spastic paraplegia (Gee, Latimer Tooth, Sachs, and others).

HYSTERICAL SPASTIC PARAPLEGIA.

This presents in the most striking manner the symptoms of spastic paraplegia. Moderate wasting is sometimes present in the hysterical paraplegia. The loss of power is not complete and the sensory symptoms are seldom marked.

PRIMARY COMBINED SCLEROSIS.

This form presents sensory symptoms as well as the motor symptoms characteristic of spastic paraplegia. The posterior as well as the anterior columns are invaded by relatively chronic sclerosis, affecting chiefly the pyramidal and cerebellar tracts. The course of the disease is quite rapid.

Symptoms.—These are sensory as well as motor. The onset is slow usually with numbness in the extremities. The reflexes are generally exaggerated and there is loss of strength, and emaciation.

Diagnosis.—This is based upon the combination of sensory and motor symptoms, increased reflexes and the absence of pain.

ATAXIA PARAPLEGIA.

Definition.—A sclerotic affection of the lateral and posterior columns, characterized by a combination of ataxia

and spastic paraplegia. It occurs most frequently between the ages of twenty and forty. Spinal injury, exposure to cold and wet are the principal causes. Rarely a history of syphilis can be obtained.

Symptoms.—There is gradually increasing paralysis of the arms and legs and the reflexes are increased; there is more or less spasm and the sensory symptoms are rare. From the start loss of co-ordination is marked. Mental symptoms may develop in the late stages.

Diagnosis.—This is easy in well marked cases. The absence of sensory and ocular symptoms, marked loss of co-ordination and increased reflexes are characteristic.

Treatment of Spastic Paraplegia.—A great many cases of spastic paraplegia have been treated osteopathically. The majority of the cases have been helped by the treatment and a few cases cured. The cases caused by traumatism and exposure to wet and cold have yielded in nearly every instance. I have been surprised in many cases to find that they yield to the treatment when after several years' standing. If long standing cases will improve under osteopathic treatment what may we expect when we will have a fair chance with this "incurable disease?" Surely osteopathic treatment has a marked effect upon the circulation of the spinal cord.

The treatment is largely like that of locomotor ataxia. The lesions are readily located within the spinal column. In a few cases slight posterior curvatures of the dorsal lumbar region are found. The majority of the lesions are in the lower dorsal region. Special care should be given to the bladder and bowels. Prolonged warm baths are beneficial. The treatment to the legs directly is always secondary to the spinal treatment.

LOCOMOTOR ATAXIA.

Synonyms.—Tabes dorsalis; posterior spinal sclerosis.

Definition.—A degenerative affection of the nervous system manifested by inco-ordination of movement, loss of deep reflexes, sensory and trophic symptoms, and various ocular disturbances; characterized anatomically by a degeneration of the posterior columns of the cord, also of the spinal ganglia and posterior roots and by foci of degeneration in the basal ganglia and in the cortex of the brain.

Etiology.—Most cases occur between the ages of thirty and forty. Males are more frequently affected than females. Syphilis, hereditary influences in neurotic families, prolonged exposure to cold and wet, alcoholism and sexual excesses are predisposing causes. Concussion and traumatism affecting the spine are also causes. Osteopathic examination reveals the fact as given us by medical writers, that locomotor ataxia is not primarily caused by sclerosis of the posterior column, but that the primary affection is involvement of the peripheral sensory nerves by vertebral and rib dislocations. These deranged anatomical structures press upon the sensory fibres and thus interfere with the protoplasmic processes to the spinal ganglia and sensory tract. Consequently the sclerosis of the posterior column is not a primary systemic affection but a sequence of the obstruction to the peripheral sensory fibres. These vertebral and rib dislocations in locomotor ataxia usually occur in the lower dorsal and lumbar regions. The disease is more often in cities.

Morbid Anatomy.—The peripheral nerves may be degenerated. The posterior roots and their ganglia are small, atrophied and of a grayish color. The membranes over the posterior columns are commonly thickened and opaque and often adherent. The posterior columns of the cord are hardened, atrophied and of a grayish color. The

nerve fibres are atrophied and there is an overgrowth of connective tissue. The marked changes in the cord are found in the lower dorsal and upper lumbar segments. In long standing cases there is degeneration of the ascending antero-lateral tract, of the direct cerebellar tract and of the pyramidal tract. The cerebral changes consist of sclerosis in the restiform bodies, in the inferior peduncles of the cerebellum and of certain cranial nerves, especially the third optic, vagus and auditory nerves and cortical changes consisting of a diffused meningo-encephalitis.

Symptoms.—*Motor Phenomena.*—These are usually the earliest and most prominent symptoms. There is inability to co-ordinate the muscles. The patient first notices that he cannot walk steadily when in the dark or when he has his eyes closed. Later he finds that he cannot maintain his equilibrium even in daylight; this is ascertained when the patient places his feet together and also when the eyes are closed. As a rule this is unaccompanied by muscular wasting so there is no loss of motor power. Soon the gait becomes characteristic; in walking the feet are lifted high and are brought down heavily on the heel; then the ball of the foot comes down last, producing what is called the "double step," the walk is straddling, the limbs are thrown about and there is staggering due to incor-ordination. The eyes are fixed upon the ground, a few feet in front of him and he is able to walk only by the use of a cane. Incoordination also develops in the hands, but usually later in the disease.

Sensory Phenomena.—Pain is almost always present; it is of a darting, shooting or stabbing character and appears in paroxysms. They are most common in the legs, lasting but a second or two and as often accompanied by a hot burning feeling. Herpes may appear along the course of the nerve. Anaesthesia or hyperaesthesia of certain areas

may occur. The muscular sense is more or less impaired; there is a feeling as if there was cotton between the patient's feet and the floor and retardation of tactile sensation is a common symptom. The power of localizing pain is also often lost.

Visceral Pains of Crises.—These are chiefly gastric and are sometimes accompanied by obstinate vomiting. Laryngeal, rectal, urethral and nephritic crises may occur and at times are exceedingly severe. Laryngeal crises may be manifested by intense dyspnoea and noisy breathing, with a fatal result. Constipation is extremely common. There may be retention of the urine resulting in cystitis. Sexual power is generally lost early.

Reflexes.—The knee jerk is lost early in the disease. Occasionally however cases are met with where it is retained, but rarely this is so. The skin reflexes are also impaired; in some cases they may be increased at first but later are sure to be involved with the deep reflexes.

Trophic Changes.—These occur later in the disease. The so-called arthropathies or joint lesions are the most curious and may occur at any period of the disease. It consists of an enlargement of the joints, associated with serous exudations which rarely become purulent; atrophy of the heads of the bones, destruction of the bones and cartilages, or spontaneous fracture or dislocation may occur owing to the brittleness of the bones. There is no pain and the large joints are most frequently affected; and these may be excited by an injury. Herpes, skin ecchymoses, oedema, local sweating, alterations in the nails, perforating ulcer of the foot, onychia, decay of the teeth and atrophy of the muscles may occur.

Special Senses.—The pupil does not respond to the light but still accommodates for distance, constituting the Argyll-Robertson pupil. Ptosis may develop with or with-

out strabismus. Optic atrophy which may lead to blindness, paresis of the ocular muscle and contracted pupils may occur. The ocular symptoms may appear early in the disease.

The auditory nerve is rarely affected but in some cases there may be deafness. There may be attacks of vertigo. Olfactory symptoms are rarely met with.

Cerebral Symptoms.—These are rare. Hemiplegia which may occur late in the disease due to haemorrhagic softening, which is caused by disease of the vessels or to progressive cortical changes; haemianaesthesia, dementia paralytica, melancholia, dementia, convulsions or paranoia may develop. Paralysis may develop and the patient becomes bed ridden. The disease itself does not prove fatal; the patient may live for years until some intercurrent disease causes death.

Diagnosis.—This is usually easy when the characteristic symptoms are developed. The presence of lightning pains, absence of the knee jerk, early ocular palsies, a squint, ptosis and Argyll-Robertson pupil makes the diagnosis conclusive.

Differential Diagnosis.—Multiple Neuritis.—The lightning pains are absent; the Argyll-Robertson pupil is absent; the muscles are tender; there is frequent herpetic rash and there is atrophic paralysis.

Ataxic Paraplegia.—There is absence of pain and eye symptoms.

Cerebellar Disease.—There is loss of co-ordination also, but the knee jerk is present and there is persistent vomiting, headache, optic neuritis, but no lightning pains.

Gastralgia.—Gastric crises may be mistaken for gastralgia, as any of the crises may be mistaken for disease of the various organs involved. If repeated attacks of gastralgia

occur in middle aged men it is well to make a careful examination of their eyes and knee joints.

Prognosis.—The earlier the case is treated the better the outlook. The progress of the disease can be arrested and some cases are entirely cured with persistent treatment.

Treatment.—My experience in the treatment of locomotor ataxia has been that quite often the disease can be checked and the symptoms relieved; but curing a case of locomotor ataxia except in the early stage I believe is impossible. Most assuredly when there is degeneration of nerve tissues we cannot hope for a cure. Those with a syphilitic history are by far the hardest to relieve.

I have had several cases under my care or observation for the past few years, and the most that was done for the advanced cases was relief of the symptoms and more or less checking of its progress. Still many cases in the earlier stages were cured or greatly benefited. The treatment consists of thorough correction of the spinal derangements found, especially through the lumbar and lower dorsal regions. If the disease has involved the arms or brain, thorough treatment should be given the entire length of the spine with a view of increasing the circulation in the spinal cord and brain, and thus checking or preventing the tissue degeneration.

Careful treatment of the limbs should be given, but be exceedingly cautious in the treatment of the limbs of advanced cases as there is considerable danger of producing fractures. Stretching the thigh muscles and internal and external rotation treatment of the legs should be given. See that the bowels are moved daily and be positive that there is no retention of urine in the bladder. Occasionally a catheter has to be used in some cases. The patient should be careful about taking too much food and especially beware of indigestible food as it irritates gastric crises.

During painful attacks the patient should rest in bed and with careful treatment the attack can generally be relieved. Hot applications are of considerable aid.

The patient at all times should avoid excesses. Work of some character should be given the sufferer. Do not promise to help the patient much short of several months' treatment.

HEREDITARY ATAXIA.

Synonyms.—Friedreich's disease; hereditary ataxic paraplegia.

Definition.—A hereditary disease due to posterior and lateral sclerosis, and occurring in early life in certain families. It is characterized by symptoms resembling locomotor ataxia.

Etiology.—It may be hereditary, but not always. It occurs most frequently between the ages of two and fifteen. Alcoholism and syphilis are rarely present in the parents. Acute diseases, especially infectious fevers, and injuries to the spine may be exciting causes.

Morbid Anatomy.—An extensive sclerosis of the posterior and lateral columns of the spinal cord is present.

Symptoms.—Impaired co-ordination, beginning in the legs and later extending to the arms, is the first marked symptom. The gait is peculiar, which is swaying and irregular, like a drunken man, and it lacks the pronounced stamping gait of true ataxia. There is loss of reflexes, while no sensory symptoms are present as a rule. The sphincters are normal. Nystagmus is present and is a characteristic symptom. The speech is scanning. Talipes and lateral curvature of the spine are common. There is no mental change. The course is always very slow.

Diagnosis.—This is not difficult as a rule especially when several cases occur in one family. The age, spinal curva-

ture, nystagmus, inco-ordination, scanning speech, shambling gait, and deformity of the feet are striking symptoms.

Locomotor Ataxia—Appears later in life and there is a great difference in the gait; while the absence of sharp pains of aneasthesia and of the Argyll-Robertson pupil will differentiate between the two.

Treatment.—I have a case under treatment at the present time and after six months' treatment the improvement is marked in every way. The same treatment as in locomotor ataxia is followed. In this case the lesions presented are at the tenth and eleventh dorsal, and at the second and third cervicals, although the spinal column on the whole is quite debilitated.

SYRINGO-MYELIA.

Definition.—A chronic affection of the spinal cord in which there is an embryonal neurogliar overgrowth about the central canal with cavity formation. It is characterized, clinically, by progressive muscular atrophy, peculiar disturbances of sensation and various trophic and vaso-motor disorders.

Etiology.—The onset generally takes place before the thirtieth year. Males are much more commonly affected than females.

Morbid Anatomy.—The condition begins with an overgrowth of embryonal neurogliar tissue. This is followed by degeneration of the gliomatous tissue with a formation of cavities, or this cavity formation may be the result of haemorrhage. The disease in most cases involves only the cervical or dorsal regions, and is usually in the posterior or posterio-lateral tracts. The cavity has a variable extent in the cord and it may prevail throughout the entire extent, but as a rule only the cervical and dorsal regions or more limited areas are involved. The cavities lie in the gray matter.

Symptoms.—The onset is slow. The symptoms depend upon the situation and extent of the cavity. As the disease most frequently involves the cervical region, the neck and arms are usually involved.

At first neuralgiac pains may develop in the muscles. Later there is progressive muscular atrophy, loss of painful and thermic sensations. Tactile and muscular senses are usually intact. The reflexes are increased and a spastic condition is present. The lower limbs usually escape, but when they are involved the clinical picture may be that of amyotrophic lateral sclerosis. The special senses and the sphincters are usually uninvolved. A lateral curvature is present.

A form of syringo-myelia, known as *Morvan's* disease, is characterized by neuralgiac pains, cutaneous anaesthesia and painless felons.

Diagnosis.—The progressive muscular atrophy, the retention of muscular and tactile senses, and the loss of thermic and painful sensation are typical symptoms.

The diseases with which it may be confounded are:

Cervical Pachymeningitis.—The pain is usually greater, the tactile sense is lost and it runs a more rapid course.

Anaesthetic Leprosy.—The trophic changes are more marked, tactile sensation is lost and the phalanges often drop off.

Progressive Muscular Atrophy and *Amyotrophic Lateral Sclerosis.*— Sensory symptoms are wanting.

Duration.—This is from five to twenty years.

Prognosis.—The prognosis is unfavorable.

Treatment.—Little can be done except attending to the diet and hygiene of the patient and meeting urgent symptoms. Possibly, continued treatment along the spinal column would influence the circulation of the cord in the region of the involvement to some extent.

PROGRESSIVE MUSCULAR ATROPHY.

Synonyms.—Chronic degeneration of the motor nuclei; amyotrophic lateral sclerosis; chronic spinal muscular atrophy; chronic poliomyelitis; wasting palsy.

Definition.—A disease characterized by a slow but progressive loss of power and by muscular atrophy. Anatomically it is characterized by degeneration of the ganglion cells of the gray matter in the cord.

Etiology.—The cause is unknown. It is a disease commonly of males in middle life. It sometimes follows cold, wet, exposure, traumatism, mental worries, or prolonged emotional excitement. Hereditary influences are present in some cases. In all cases lesions are detected in the vertebrae and ribs corresponding to the innervation of the diseased areas. Very likely in a number of cases these lesions are the starting point of the disease.

Morbid Anatomy.—The muscles are wasted, the fibres undergo fatty degeneration and there is an overgrowth of connective tissue. The peripheral motor fibres are degenerated. The anterior nerve roots leading to the horns are atrophied. The large ganglion cells of the anterior horns are atrophied or even entirely removed. The neurogliar tissue is increased. There is sclerosis of the anterior and lateral pyramidal tracts of the cord in the majority of cases. The pyramidal tracts have been found degenerated through the pons and internal capsule, even up to the motor cortex. When bulbar symptoms are present there is degeneration of the motor nuclei of the medulla.

Symptoms.—Irregular pains are sometimes felt in the region that is soon to become wasted. The upper extremities are first affected. The muscles of the ball of the thumb waste early, then the interossei. From atrophy of the interossei and contraction of the long extensor and flexor muscles the deformity known as "claw hand" results. The

wasting creeps up the forearm, arm and shoulder. The muscles of the trunk are gradually affected. The muscles of the lower extremity may escape entirely. The platysma myoides does not waste and is often hypertrophied. The face muscles are attacked late or not at all. The affected muscles are often the seat of fibrillary tumors. Deformities and contractures develop, notably lordosis. Sensation is not impaired although the patient may complain of numbness and coldness. The bladder and rectum are not affected but sexual power may be lost. The paralysis is flaccid and the reflexes absent in the so-called atonic cases. In tonic atrophy there is more or less spasm, the reflexes are greatly increased, there are often contractures and the wasting is usually trifling.

Diagnosis.—*Primary Muscular Atrophy.*—This disease usually develops in earlier life. The hereditary tendency is more marked—often affecting many members of a family. It rarely begins in the hand.

Prognosis.—The prognosis of progressive muscular atrophy is not favorable, although a number of cases have been greatly helped by a thorough course of treatment.

Treatment.—The treatment consists of a thorough stimulating treatment of the innervation of the affected regions, with thorough manipulations of the muscles and parts diseased. Of course correction of the lesion to the vertebrae and ribs which is involving the innervation to the diseased tissues is of primary importance. A cure cannot be expected when degeneration of the nerve centers has occurred, still the progress of the disease may be checked in many cases, and the patient occasionally gains considerable strength. When atrophy starts in the muscles of the ball of the thumb the lesion is to the median nerve, and derangements of the cervical vertebrae from the fifth to the seventh

may be found. Attention to the general health is important. Out door life is preferable and gymnastic exercises are of value.

BULBAR PARALYSIS.

Synonym.—Glosso-labio-laryngeal paralysis.

Definition.—A progressive paralysis invading the lips, tongue, pharynx and larynx; due to involvement of the motor nuclei of the medulla oblongata. It is rarely primary, more frequently secondary to some condition affecting other portions of the motor path. It may be either acute or chronic.

Acute or Apoplectiform.—This results either from haemorrhage, embolism or inflammatory softening. The onset is usually sudden. The speech is absent or entirely lost. There is dribbling of saliva, difficult swallowing, the lips are flabby and flaccid and frequent choking spells occur. These cases generally prove rapidly fatal. Rarely they become chronic.

Chronic Bulbar Paralysis.—This may result from progressive muscular atrophy, insular sclerosis, amytrophic lateral sclerosis, acute ascending paralysis or chronic polio-myelitis, involving primarily the medulla. The paralysis starts in the tongue; the first symptom being a slight defect in the speech and the patient not being able to speak for any length of time without fatigue. When the lips become involved the patient cannot whistle and speech is rendered still more difficult. The lips are prominent and the lower one drops. The saliva is increased in amount and there is constant drooling. Mastication of the food becomes difficult. The tongue becomes atrophied and the mucous membrane becomes wrinkled. Fibrillary tremors of the lips and tongue are present. There are no sensory symptoms. Taste is normal.

The course of the disease is slow. Death may result from aspiration pneumonia; sometimes from choking or to interference with respiration and circulation.

Diagnosis.—This is generally easy, as the symptoms are well marked.

Prognosis.—The prognosis is unfavorable.

Treatment.—Little can be done in the majority of cases. Only in those cases where the paralysis is caused by cervical lesions can much hope be given. Derangements of the cervical vertebrae, especially the atlas and axis, occasionally influences the circulation in the medulla to such an extent, that the motor nuclei are greatly involved. The dislocated vertebrae may interfere with the blood vessels directly or through the vaso-motor nerves. When the onset is not abrupt the prognosis is more favorable. When deglutition is impaired the stomach tube should be used in feeding the patient to prevent the food from passing into the trachea.

DISEASES OF THE BRAIN.

DISEASES OF THE DURA MATER.

Pachymeningitis Externa.—Inflammation of the external layer may be caused by traumatism, caries of the bone, syphilis and disease of the middle ear. In the syphilitic variety the inner table of the skull is thickened and roughened, and there may be a large collection of pus between the dura and the bone. Rarely the pus is infiltrated between the two layers of the dura.

Symptoms.—These are indefinite especially in mild cases. There may be pain, delirium, malaise, chills, sometimes fever, and rarely convulsions. Pressure symptoms may be present with or without paralysis.

Pachymeningitis Interna.—This is usually chronic and occurs in three forms—purulent, pseudo-membranous and

haemorrhagic. The first two forms are not important and are not recognized before death. The *purulent* form may follow an injury, but more frequently it is an extension from inflammation of the dura. The *pseudo-membranous* form may occur as a secondary process in infectious diseases. Pus is rarely found between the dura and arachnoid membranes.

Haemorrhagic Pachymeningitis.—Haemorrhagic pachymeningitis or haematoma of the dura mater is a very rare disease in general practice. It is much more common in large almshouses and asylums.

Etiology.—It occurs chiefly in males over fifty years of age. It is most frequently the result of chronic alcoholism and chronic insanity. It has also been found in acute fevers, anaemia and other blood conditions.

Morbid Anatomy.—The blood vessels become tortuous and dilated. A delicate reticulated, vascular membrane is formed which extends over the greater part of one or both hemispheres. According to Virchow the formation of this membrane precedes the haemorrhage. In some cases the membrane is laminated. Haemorrhagic effusions are observed between the membranous layers. They vary in extent from slight ecchymoses to large collections of blood.

Symptoms.—The symptoms are often obscure. In some cases it is only found post mortem. Hallucinations and headache are sometimes prominent symptoms.

Diagnosis.—This cannot be made with certainty.

Treatment of the Dura Mater.—The patient should have absolute rest and quiet. Treatment of the primary disease is necessary; then a cervical treatment as in inflammation of the brain is indicated. Ice-bags may be applied to the head. When pus is formed surgical interference is necessary. Attention should be paid the digestive tract; and

sponging or cool bathing of the body for the fever are helpful measures. A free movement of the bowels will aid in lessening the inflammation. Milk and animal broth are the best foods.

DISEASES OF THE PIA MATER—LEPTOMENINGITIS.

Definition.—In this form there is an inflammation of the pia and arachnoid membranes, and the exudate occurs between these two membranes.

Etiology.—It is more common in males than females. All ages may be affected. The direct causes are chronic Bright's disease, gout, cerebro-spinal meningitis, cachexia, the infectious fevers, injury, diseases of the bones of the skull, syphilis (rarely) and eruption of miliary tubercles. Sunstroke and brain work are doubtful causes.

Morbid Anatomy.—The inflammation may be limited to the base, to the convexity or it may involve both the convexity and base. The membranes are opaque, infiltrated and more or less adherent. Pus is present in some cases. The convexity is generally the part involved. The ventricles may be involved.

Symptoms.—The cases in which the symptoms point to involvement of the base have been considered under tuberculous meningitis. Headache, malaria, insomnia, high fever, vomiting, constipation, a coated tongue, rapid pulse, convulsions and coma may be met with in different cases. When the base is involved the cranial nerves may be affected. Strabismus or ptosis may occur. Facial spasm or palsy, if the facial nerve is involved; if the fifth nerve is affected, sensory and trophic changes are observed. A knowledge of the etiology is very important, as a clue to the diagnosis.

Prognosis.—The prognosis is always very grave.

Treatment of the Pia Mater.—The treatment is largely the same as for inflammation of the dura mater. The treatment of the causal disease is of primary importance. Surgical operations should not be delayed when indicated.

HYPERAEMIA.

Synonyms.—Cerebral hyperaemia; congestion of the brain.

Definition.—An abnormal increase in the amount of blood in the blood vessels of the brain. The congestion may be either active or passive.

Etiology.—*Active Hyperaemia.*—This form results from prolonged mental activity, the use of certain drugs—alcohol, amyl nitrite, nitro glycerine—plethora and functional irritation.

Passive Hyperaemia.—This results from some local obstruction to the return of blood from the brain, such as tumors in the neck, straining, emphysema and mitral disease; also lesions in the vertebrae interfering with the blood supply from the brain.

Morbid Anatomy.—There are no marked changes in the brain. Active congestion often leaves no trace post-mortem. An unusual distinctness of the puncta vasculosa is sometimes seen. In passive congestion the vessels are engorged.

Symptoms.—These are not very characteristic or constant. In *active hyperaemia* there may be headache, vertigo, a sense of fullness or pressure, irritability, rapid pulse, insomnia, restlessness, confusion of ideas, and in some cases delirium, hallucinations and even convulsive movements.

In *passive hyperaemia* the symptoms are less pronounced, slower in their development, and in severe cases there may be torpor, dullness of the intellect and finally coma.

Treatment.—The treatment of hyperaemia of the brain consists largely of an inhibitory treatment in the cervical region. The treatment should be applied to the upper and middle cervical regions. This certainly would influence the nerves (if such exist) that control the cerebral vessels. Nevertheless, it has a marked influence upon the vessels, as such a treatment always lessens the amount of blood in the brain, to a greater or less extent. Possibly, the treatment dilates the various vessels of the body, and thus there is a tendency to equalize the vascular system.

If lesions are found in the cervical region, exclusive of contracted muscles, they should be corrected. The head should be kept raised. Heat applied to the feet and cold to the head will be found helpful. Also, increasing the activity of the bowels and kidneys will tend to lessen the blood pressure in the brain. The diet should be a liquid one.

In a few cases lesions may be found in the cervical region affecting directly the blood vessels to and from the brain, but as stated the most common lesions are contracted cervical muscles. The first or second ribs on the left side may be found dislocated and interfering with the subclavian vessels. Pressure on the carotids will temporarily aid in lessening the amount of blood to the brain. In all cases the clothes about the neck should be loose, and the shoulders and neck kept raised to avoid any flexion of the neck. Treatment of the spine through the splanchnics will tend to lessen the amount of blood to the head by dilating vessels elsewhere.

ANAEMIA OF THE BRAIN.

Definition.—A condition in which the quantity of blood in the brain is diminished, or the bulk of the blood may be normal, but there is alteration in the quality.

Etiology.—It may be due to haemorrhage, diarrhoea or to dilatation of the intestinal vessels from sudden withdrawal of ascitic fluid. Feeble action of the heart, ligature of one carotid and obstructive endarteritis of the vessels carrying blood to the brain are also causes. Subdislocations of the cervical and upper dorsal vertebrae, and deeply contracted muscles in the same region may be located, which are causing the disturbances to the blood supply of the brain.

Morbid Anatomy.—The gray and white matter are pale. The puncta vasculosa are less distinct and few are seen. Only the large vessels are full of blood, the small vessels over the convolutions are quite empty. The cerebro-spinal fluid is usually increased.

Symptoms.—There may be dizziness, noises in the ears, confusion of ideas, drowsiness, inability to stand, and flashes of light. The skin is cold and covered with sweat; the respiration becomes hurried, and finally there may be loss of consciousness and even death may succeed, if the haemorrhage continues. In the more chronic form there may be mental apathy, extreme lassitude and sleeplessness or sometimes there may be insomnia. In other cases there is headache, vertigo, tinnitus, hallucinations or delirium. Hydrocephaloid symptoms have been described by Marshall Hall. They occur in young children after diarrhoea. The child is in a semi-stupor, with eyes open, pupils contracted and depressed fontanelles. The coma may become profound and death result.

Treatment.—The treatment of anaemia of the brain is, principally, to have the patient flat upon the back with the head low, and to give a stimulating treatment of the cervical region, to increase the blood supply to the vessels of the brain. If lesions are found in the cervical region interfering with the vessels passing through the neck, such lesions should at once be removed. The heart's action should be

stimulated and nutritious food administered. In severe cases absolute physical rest is demanded. Most of the cases are due to mechanical pressure, as heart and lung diseases, tight clothing, and lesions of the cervical and upper dorsal regions, interfering directly with the blood from the brain.

In cases of *fainting* place the patient in a recumbent posture and stimulate with cold water. Also give a stimulating treatment to the cervical region, and raise the ribs, especially the fourth and fifth over the heart. All tight clothing about the neck and chest should be loosened. A thorough dilatation of the rectal sphincters will oftentimes cause return of consciousness, when the other methods fail.

OEDEMA OF THE BRAIN.

Definition.—An abnormal accumulation of cerebro-spinal fluid in the sub-arachnoid space, and in the meshes of the pia. In some cases there is moistness of the brain itself.

Etiology.—It is caused by mitral stenosis, Bright's disease and atrophy of the convolutions. It is also the result of active or passive hyperaemia. Lesions to the cervical vertebrae may be found causing the hyperaemia.

Morbid Anatomy.—The sub-arachnoid space is filled with clear fluid. The brain substance is anaemic, moist and glistening. The fluid in the ventricles is generally increased in amount. In some cases the brain substance is infiltrated and softened.

Symptoms.—They are generally those of anaemia and are illy defined. This affection is always secondary, and the symptoms may be marked by those of the primary disorder. Cases in which unilateral convulsions or paralysis have occurred in connection with Bright's disease have been ascribed by Traube and Rosenstein to oedema of the brain.

Treatment.—The treatment of oedema of the brain depends upon the causes. The heart should be stimulated

when due to heart disease; and when the oedema is due to kidney diseases, the kidneys should be treated primarily. Careful treatment of the cervical region will always be of aid, and in a few cases lesions will be located in the neck, interfering with the flow of blood from the brain.

CEREBRO-APOPLEXY.

Synonym.—Cerebral haemorrhage.

In the majority of cases the bleeding comes from the central branches of the circle of Willis, especially the central branches of the middle cerebral in the anterior perforated spaces, in which pass the corpus striatum and internal capsule. One of the largest of these branches which passes to the internal capsule and lenticular nucleus was named by Charcot "the artery of cerebro-haemorrhage," because it was so frequently found involved. Rarely any of the large arteries of the circle of Willis are found ruptured. The term cerebro-apoplexy is properly applied to haemorrhage in the brain substance alone, though bleeding into the meninges, termed meningeal haemorrhage, is generally included in the term.

Etiology.—The affection is most frequently met with in the old, as there is a natural tendency to degeneration of the vessels, and in the very young in whom they are naturally weak. Any cause which tends to degenerate the arteries predisposes to apoplexy. Gout, alcoholism, syphilis, Bright's disease, embolism, and aneurism of the vessels of the brain, are predisposing causes. Heredity predisposes as there are families in which the arteries degenerate early. Probably lesions in the cervical region, especially the atlas and axis, predispose to apoplexy, by weakening the circulation in the brain and lessening the resistance of the walls of the blood vessels. Usually lesions are found at the atlas and axis. The lesions may affect the blood vessels directly,

or the vaso-motor nerves may be involved. Exciting causes are violent exertion, particularly straining efforts, mental or physical excitement and alcoholic excesses, and in children convulsions or whooping cough.

Morbid Anatomy.—Rupture of the miliary aneurisms, which occur most frequently on the central arteries, is the most common causes of cerebral haemorrhages. These aneurisms are also found, but more rarely, on the smaller branches of the cortical vessels. On section of the brain substance they may be seen as small, dark points about the size of a pin's head, and are very distinct upon arteries withdrawn from the anterior perforated space. Aneurisms on the branches of the circle of Willis are by no means uncommon. The haemorrhage may be meningeal or central.

Meningeal haemorrhage may be outside the dura between it and the bone, or between the dura and the arachnoid, or between the arachnoid and the pia-mater. This form of haemorrhage may be caused by fracture of the skull, it may occur in the infectious fevers, in anaemia and leucaemia, or an intra-cerebral haemorrhage may burst into the meninges. A special variety is seen in the new born produced from injury during birth.

Central haemorrhage most frequently occurs in the neighborhood of the corpus striatum, especially toward the outer section of the lenticular nucleus, and if large it may burst into the lateral ventricle, into the white matter of the central ovale or extend to the insula. Haemorrhages into the cerebellum are not uncommon.

Ventricular haemorrhage in a large number of cases is due to a more or less extensive laceration of the brain matter. The blood may be found in only one ventricle, but usually it is in both lateral ventricles. The third and fourth ventricles may contain blood also.

If the haemorrhage has not been very copious and the

patient survives, changes take place at once in the extravasated blood. The clot loses its color, shrinks and is finally absorbed, the connective tissue proliferates and leaves a more or less pigmented scar. In other cases, reactive inflammation about the lesion, results in the formation of a wall enclosing the cyst, with clear straw-colored fluid contents. Large effusion in the motor path may produce secondary changes—either softening of the cerebral tissue beyond or a degeneration in the fibrin of the anterior part of the pons, in the pyramidal fibres of the medulla, in the direct fibres of the cord of the same side, and in the crossed pyramidal fibres of the opposite side.

Symptoms.—Premonitory signs are rare. The patient is generally seized without any warning. In other cases there may be a feeling of fullness in the head, headache, depression or sensations of numbness, tingling or pain in the limbs, possibly choreiform movements. In many cases there is sudden loss of consciousness, while in other cases, the onset is more gradual and loss of consciousness may not occur for a few minutes after the patient falls, or after motor weakness is manifested. The patient cannot be aroused, the face is usually congested, but some times it is pale. Breathing is stertorous and in grave cases of the Cheyne-Stokes' type. The pulse is usually slow and full. The pupils vary and may either be contracted or dilated. The temperature may be abnormal, but is often subnormal and in basal haemorrhage it may be high. The urine and faeces may be passed involuntarily. Convulsive seizures are not uncommon. Even while the patient is comatose the paralysis can be detected. The head and eyes may be turned strongly to one side (conjugate deviation). If the arm or leg is lifted it drops lifeless, or unnatural rigidity is manifested, and one cheek often flaps more than the other. In grave cases the patient does not awake from the coma.

The symptoms all deepen and the patient dies. In other cases unconsciousness returns partially or completely, and in about forty-eight hours from the onset, there may be a febrile reaction due to cerebral inflammation, during which the patient may die, or if consciousness has been regained, there may be delirium or recurrence of the coma. When the attack does not prove fatal consciousness is finally restored, while the signs of paralysis gradually grow less, but almost never disappear completely.

Hemiplegia.—When this is complete it involves the face, arm and leg. The facial paralysis is partial, involving only the lower portions of the facial nerve, so that the frontalis and orbicularis oculi escape. The tongue when paralyzed upon protrusion deviates toward the paralyzed side, the arm is, as a rule, more completely paralyzed than the leg and in some cases the face and arm alone are paralyzed. The trunk muscles almost always escape. The trapezius is the one involved if any, and that but slightly, allowing the shoulder to drop a little. Sensation is but slightly impaired. The deep reflexes are increased on the affected side and the skin reflexes are diminished or lost. As a rule, there is no wasting of the paralyzed limbs. Later in the history of the case, secondary contraction or late rigidity comes on. This is most marked in the upper extremity, the arm and hand being flexed.

Crossed Hemiplegia.—When a lesion occurs in the lower part of the pons, the facial nerve may be involved, causing facial paralysis on the same side as the lesion and hemiplegia of the opposite side. The fifth nerves may be affected with the sensory tract, producing loss of sensation in the region in which the fifth nerve is distributed, one the same side as the lesion, and loss of sensation on the opposite side of the body.

Lesions of the crus may lead to motor oculi paralysis

of the same side, and paralysis of the face, arm and leg of the opposite side.

Conjugate Deviation.—In right hemiplegia, the eyes and head may look toward the left side. This is often an early symptom and generally passes away, but it may continue for weeks. If convulsions or spasms or early rigidity develop, the eyes and head are rotated toward the paralyzed side or away from the side of the lesion. These symptoms are only associated with cortical lesions, particularly when in the neighborhood of the supramarginal and angular gyri.

The conjugate deviation may also occur in lesions of the internal capsule or the pons, but the phenomena are reversed, i. e., the patient looks away from the lesion and in spasms or convulsions looks toward the lesion.

Diagnosis.—The coma of apoplexy may simulate the coma from uraemia, opium poisoning, alcoholism or epilepsy. In epilepsy there is a history of previous convulsions. In opium poisoning, the coma is slow in its onset and the pupils are uniformly contracted. In alcoholism, there is a history of constant drinking and usually there is the odor of whiskey.

Great care should be taken in the diagnosis, as mistakes are very common.

Embolism.—This usually occurs in early life, generally there is valvular heart disease, disturbances of the temperature, and breathing is less marked and the pulse is often weak.

Thrombosis.—The development of the symptoms is very gradual, there is absence of stertorous breathing and the temperature is not much disturbed.

It is generally impossible to tell whether the condition is due to haemorrhage, embolism or thrombosis.

Prognosis.—Always doubtful. When the attack does not prove fatal, there is always a probability of subsequent ones.

Treatment.—The patient should be placed at once in a horizontal position, with the head somewhat raised. The clothing about the neck and chest should be loosened. Relax well all the soft tissues of the cervical region, and take particular note of the first rib, especially the left. This rib is oftentimes found elevated and thus interferes with the large blood vessels beneath it. Attention should be given the superior cervical ganglia, to control as much as possible, the vaso-motor nerves to the head, and to equalize the entire circulation. Compression of the carotid artery is effectual in lessening the blood pressure in the brain. Horsley and Spencer endorse the statement, that compression of the carotid artery lessens bleeding from the lenticulo-striate artery. An ice bag should be placed at the head and heat applied to the feet. A rectal injection of warm water should be given to cleanse the rectum thoroughly. When dyspnoea is marked, change the position of the patient and raise the ribs thoroughly on both sides. Keep the bowels and kidneys as active as possible.

Following the immediate treatment after the attack, the patient's general health must be carefully watched. The paralyzed muscles should be manipulated and massaged often, and the patient carefully protected against the effects of decubitus. All secretions should be well attended to; warm salt baths every other day will be found a useful measure. In many cases of apoplexy and especially where there is hemiplegia, the cervical region presents marked lesions, chiefly lateral or anterior dislocation of the atlas. Careful manipulation of the spinal centers and nerves, corresponding to the paralyzed region, is often helpful. It is a good plan to relax the muscles all along the spinal column, with a view to keeping the organs in a healthy tone.

Operative treatment may be useful in cases to relieve

clots in the meninges; but to attempt an operation for a deeper haemorrhage would be useless.

Occasionally, cases of haemiplegia are relieved by osteopathic treatment. In these cases lesions are presented at the atlas and axis or in the upper dorsal region. I do not believe that these are cases of cerebral haemorrhage, as they are invariably diagnosed by the physicians, who had the cases prior to osteopathic treatment; although usually a few cerebral symptoms are presented. Probably, the lesions in the cord are primary and the effect upon the brain tissue is a secondary one (reflex), either due to the nerves directly, or to the blood vessels. When the lesion is at all severe in the brain little hope can be given the patient. The treatment in such instances, would be to improve the quality of the blood and to relieve any nervous obstructions to the brain, with a view to absorbing the clot. Possibly, an important predisposing cause of apoplexy is a lesion in the cervical region, which would influence, more or less, the blood pressure in the brain, as well as to nutrient nerves to the blood vessels.

Something can usually be done to prevent apoplexy. Treatment of the heart and kidneys, with attention to the diet and digestive system, will be of some aid, at least in preventing an attack. The spinal column, especially the cervical region, should be carefully examined and treated. The patient should lead as quiet a life as possible and everything done to build up the general health.

EMBOLISM AND THROMBOSIS OF THE CEREBRAL VESSELS.

Synonym.—Cerebral softening.

Embolism.—The embolus is, in the majority of cases, a vegetation from a diseased valve in the left ventricle. Less frequently it is a portion of a clot in the auricular appendage, from an aneurism, or calcareous particles, from an athero-

matous vessel. It is more common in recurrent endocarditis than in acute endocarditis. It is most frequently due to heart disease, while pregnancy, with or without heart disease, and the infectious fevers, are predisposing causes. Embolism is most frequent in women and in young adults, rather than at the extremes of life. The embolus enters the left carotid oftener than the right, which is the most direct course, and passes to the left middle cerebral artery. The posterior cerebral and vertebral are more rarely affected. The basilar artery may be obstructed.

Thrombosis.—Thrombi are clots formed in the vessels. This may be primary at the point involved, or secondary about a previous embolism. Arterial degeneration, and a weak heart are predisposing causes. It occasionally follows ligation of a carotid artery. Thrombi are usually found in the middle cerebral and basilar, but the vertebral arteries and the posterior cerebral may be plugged.

Morbid Changes.—The parts supplied by the vessels which are obstructed degenerate and become soft. Sometimes the surrounding tissue presents the appearance of an infarction, and is infiltrated with blood. At other times the area is only a little paler than normal, and slightly softer. As the process of softening advances the tissue is gradually infiltrated with serum, becomes moist, and there is fatty degeneration of the nervous elements. In old persons on the surface of the cortex there is found a variety of yellow softening known as the *plaques jaunes*. Suppuration may result if the embolus is derived from an infectious focus, as in ulcerative endocarditis.

Symptoms.—Plugging the different arteries produces the following effects:

Internal Carotid.—There may be no symptoms, or if present, they vary greatly. There may be transient hemiplegia, permanent hemiplegia and coma, followed by death.

These variations depend upon the communicating vessels of the circle of Willis. If these are large and free, there is no paralysis, but if they are small or absent paralysis and death result.

Middle Cerebral.—This is the most frequently involved of all the vessels. Permanent hemiplegia usually results, if the embolus lodges before the central arteries are given off, from softening of the internal capsule. If it lodges beyond this point the hemiplegia is apt to be transient and involves chiefly the arms and face.

Anterior Cerebral.—This is rarely obstructed. Usually no symptoms follow, as the branches upon the middle cerebral are usually able to supply the same territory.

Posterior Cerebral.—This supplies the occipital and temporo-sphenoidal lobes. Rarely softening follows on account of the anastamoses with other branches to the same area. Plugging of the branch to the cuneus may produce hemianopia, or hemianaesthesia may result from softening of the crus or internal capsule.

Basilar Artery.—When this is obstructed there may be extensive paralysis on both sides of the body, involvement of both motor paths. Symptoms of bulbar disease may be present; irregularity of the heart and breathing, rigidity or spasms; the temperature may rise rapidly to 109 degrees F.

Vertebral Artery.—The left branch is more frequently plugged; this rarely occurs alone, but commonly with the basilar. The nuclei of the medulla, are involved and there are symptoms of acute bulbar paralysis. Either thrombosis, or embolism producing extensive softening may exist without any symptoms. The arteries anastomose so freely that the effects of obstruction are quickly equalized.

In embolism the onset is sudden, without premonitary symptoms; the patient usually has heart trouble. If the

left middle cerebral is blocked, aphasia is associated with the hemiplegia. This is quite a characteristic symptom.

In thrombosis the onset is gradual and there are often premonitory symptoms, such as headache, vertigo, disturbed sleep, tingling in the fingers, failure of memory; while the paralysis may begin in one hand or foot and extend slowly and in hemiplegia may be partial.

Treatment.—The patient should rest in bed with the head elevated and attention paid to the heart, bowels and kidneys. Usually the heart is feeble, and a stimulating treatment should be applied. Keeping the bowels and kidneys active renders the circulation more active, besides the urine is scanty and high colored. Stimulation of the body in general is demanded, and close care of the patient is necessary. The nutrition of the patient is maintained as in cerebral haemorrhage.

Treatment of the cervical region, to cause reflex contraction of the arteries, will increase the cerebral circulation and lessen the tendency of the blood to clot. On the other hand, in haemorrhage, the blood pressure should be lowered to favor coagulation.

In the after-treatment of the body and limbs care should be taken about too strong stimulation of the sensory nerves, as they have an influence on the brain, and might cause another attack.

CHRONIC HYDROCEPHALUS.

Definition.—A condition in which there is an excessive accumulation of fluid in the ventricles, (internal hydrocephalus) or arachnoid cavity (external hydrocephalus or hydrocephalus ex vacuo). The cases may be divided into congenital and acquired.

CONGENITAL HYDROCEPHALUS.

This pre-exists before birth and the enlarged head may obstruct labor. More commonly it is not noticed until some time after birth. The cause is unknown. It is probably due in some cases to inflammation of the ependyma of the ventricles. It frequently occurs in several children of the same family.

Morbid Anatomy.—The head is large and round. The eyeballs protude, due to depression of the orbital plates of the frontal bones. The suture is widened and numerous, Wormian bones develop in them. The bones of the cranium are exceedingly thin and translucent. The veins are marked beneath the skin, and fluctuation may sometimes be obtained.

The lateral ventricles are greatly enlarged as well as the third ventricle, while the aqueduct of Sylvius, and sometimes the fourth ventricle are dilated. They contain a variable quantity of limpid fluid which contains a trace of albumin and salts. The quantity of fluid may reach four or five liters. The ependyma is sometimes smooth, but more often it is thickened and shows small projections. The choroid plexuses are vascular, sometimes a little damaged. The cerebral cortex is thinned, the convolutions of the brain are flattened and the sulci more or less obliterated.

Symptoms.—There is slowness in mental and physical development. The child may be bright, but not as a rule. Convulsions may occur. The child is feeble and learns to walk late. Usually these cases do not live more than four or five years, the process, however, may be arrested and the patient live to adult life. Great care should be taken in order not to mistake the rachitic head for the hydrocephalic.

ACQUIRED HYDROCEPHALUS.

Etiology.—In nearly all cases there is a tumor in the third ventricle, or at the base of the brain, pressing on the venae Galeni. More rarely it is due to closure of the foramen of Magendie, by which the ventricles communicated with the cerebro-spinal meninges. This form may also be secondary to inflammatory conditions, particularly meningitis.

Morbid Anatomy.—When these conditions occur in adults, or even in early life (about the seventh year), the enlargement of the skull is not always present. In fact, the head may even be smaller than normal. In such cases, the brain yields to the pressure, while in other instances the sutures separate and the head gradually enlarges.

Symptoms.—The symptoms of hydrocephalus in the adult are never distinctive. In some cases there is early headache, gradual blindness, while signs of imbecility appear sooner or later, even though at first the child is able to pursue his studies and seems bright. In other cases, there may be prolonged attacks of drowsiness or coma with a slow pulse. There may be convulsive attacks, the gait becomes irregular and ataxic, while paresis or even paralysis may occur. The convulsions are epileptic in type, and as a rule, ultimately cause death. The symptoms may be those of brain tumor, without focal symptoms.

Diagnosis.—This is ordinarily very easy. It must not be mistaken for rachitis.

Prognosis.—This is extremely unfavorable, the majority of cases live only from two to five years. In rare cases there is apparent recovery.

Treatment.—The treatment of hydrocephalus is not satisfactory. The cases that I have treated have presented lesions in the middle cervical vertebrae. Possibly lesions in this region have some effect in exciting the disease. In one

instance the enlargement of the head was considerably relieved by correcting the cervical vertebrae.

The primary treatment is, of course, to correct the disease causing the hydrocephalus. Pressure upon the head by means of strips of adhesive plaster has been used. Keeping the bowels and kidneys active has some influence in lessening the fluid. The lumbar puncture recommended by Quincke may be employed when pressure symptoms are marked. The puncture should be between the third and fourth lumbar vertebrae, into the arachnoid sac. By puncture at this point there is no danger of injuring the cord, besides the fluid is removed slower and there is less danger of collapse. There have been some favorable results in puncturing the ventricles and removing the fluid.

INSULAR SCLEROSIS.

Synonyms.—Disseminated nodular sclerosis; sclerose en plaques.

Definition.—A chronic affection of the brain and cord, characterized by numerous sclerotic patches throughout the nerve elements.

Etiology.—The cause is not definitely known, but probably derangements of the tissues, affecting the blood vessels to the localized areas that are degenerated, is the common cause. It is claimed that the infectious diseases, especially scarlet fever, are important causes. Also, cold, wet, exposure, syphilis and mental emotion are supposed causes. In some cases heredity has been a causal factor. The disease occurs most frequently in young persons.

Morbid Anatomy.—The localized areas of sclerosis are widely distributed in the brain and cord. Very seldom is the brain or cord alone affected. The sclerosis is found, principally, in the pons, cerebellum, basal ganglia, medulla, and in the walls of the lateral ventricle. The cord is in-

volved at different points in various regions. The sclerosed patches appear as grayish red areas upon section, and are unnaturally firm. Histologically, they consist of connective tissue, in which are a few normal nerve fibres. The axis cylinder remains intact for quite a long time after the medulla of the nerve has been destroyed. There is a thickening of the walls of the vessels.

Symptoms.—The disease is always a chronic one. Loss of power in one, and then the other lower extremity, is the first symptoms. Finally the disease extends to the upper extremities. Tremors, increased reflexes, scanning speech and nystagmus occur. Atrophy of the optic nerve, and in some cases numbness, tingling and vertigo are also among the general symptoms. Mental debility, coma and epileptiform or apoplectiform attacks may be found in severe cases.

The course of the disease usually extends over a period from five to fifteen years, and death commonly results from some intercurrent disease.

Diagnosis.—After the disease has lasted for some time the diagnosis is usually easy. Three characteristic symptoms are, volitional tremor, scanning speech and nystagmus. The diagnosis may be confounded with paralysis agitans, locomotor ataxia and hereditary ataxia.

Pseudo-sclerose en plaques described by Westphal is apt to be mistaken for insular sclerosis. Nystagmus is not present, and the tremor movements are said to be more violent. It is thought to be a hysterical tremor by French writers. No lesions are found on post-mortem examination.

Prognosis.—The prognosis is not favorable.

Treatment.—The treatment should be a most thorough and persistent one, of the entire spinal column, especially the cervical spine, to correct any derangements found, to relax muscles and to stimulate the spine as a whole. Rest, and

food that is easy assimilated, are of value. Tepid bathing is a helpful measure.

INFLAMMATION OF THE BRAIN.

Synonyms.—Suppurative encephalitis; abscess of the brain; encephalitis.

Definition.—Encephalitis is an inflammation of the substance of the brain, and does not, strictly speaking, include inflammation of the membranes. In many cases however, the two conditions are present.

Etiology.—It may be traumatic, due to falls upon the head, or blows, more commonly, it follows fracture or punctured wounds. Meningitis is almost invariably associated with an abscess. Extension from some neighboring inflammatory focus, as caries of the temporal bone, due to disease of the middle ear or labyrinth is an important cause.

It may be secondary to some distant focus of suppuration, as in malignant endocarditis, hepatic abscess, chronic bronchitis with bronchiectasis, bone disease, and occasionally gangrene of the lung. It may also follow one of the infectious fevers.

Morbid Anatomy.—The abscess varies in size from a half to three inches in diameter, or it may be large enough to fill an entire lobe, though this is rare. They may be solitary or multiple. In very acute cases the abscess is not limited; when of longer duration it is inclosed in a definite capsule. The pus within the abscess usually has a greenish tint and an acid reaction. The surrounding tissues are oedematous and more or less infiltrated. The abscesses are usually solitary except in pyaemic cases when they are multiple and usually small. The cerebrum is most frequently involved, and the temporo-sphenoidal lobe more than any other part. In ear disease the cerebellum is most commonly affected.

Symptoms.—Abscesses following injury, may run an acute course, and fever, headache, delirium, vomiting, rigors, convulsions and coma may be present. In more chronic cases, the general symptoms are severe headache, vomiting, fever, twitching, drowsiness, vertigo and mental impairment. In the "silent regions," when the abscess becomes encapsulated, no symptoms may be presented. An abscess may be "latent" for from a week to two months or a year or more in almost any region. The local symptoms vary with the location of the abscess. When in the parieto-occipital region, there may be hemianopia; in the cerebellum, vomiting and loss of co-ordination occurs; in or near the motor area, there may be convulsions or paralysis; in the temporo-sphenoidal lobe, deafness and aphasia. In abscess of the temporo-sphenoidal lobe and parieto-occipital region, there may be no focal phenomena.

Diagnosis.—In acute cases there is rarely any difficulty. In chronic cases difficulty may arise. Tumor of the brain may produce identical symptoms. In abscess however, the presence of fever is a distinctive symptom.

Prognosis.—The prognosis is always grave.

Treatment.—The only treatment that would be successful when abscesses have formed would be trephining. For the operation in brain abscesses, see surgical works. Preventive measures, such as proper treatment of ear diseases, is of great importance, as abscesses may follow such a disease.

In inflammation of the brain without abscess formation, the treatment would be principally, a cervical one to equalize the vascular supply of the brain; and to correct lesions, as deeply contracted muscles, and vertebral lesions to the veins from the brain. Lesions may occur in the upper dorsal vertebrae, upper ribs and clavicle and influence the blood

supply to the brain. Rest and an ice cap are of importance.

GENERAL AND FUNCTIONAL DISEASES.

PARALYSIS AGITANS.

Synonyms.—Shaking palsy; Parkinson's disease.

Definition.—A chronic nervous disease characterized by tremors, muscular weakness, muscular rigidity and alterations in the gait.

Etiology.—The disease usually commences after forty years of age, but occasionally it occurs from the thirtieth to fortieth years. It is somewhat less frequent in males than in females. Heredity seems to have but little influence in the cause of the disease. Among the principal causes of the disease, are physical injuries, exposure to cold and wet, emotion, business worry, alcoholism, sexual excesses and acute diseases. Physical injuries, in conjunction with exposure to cold, is the best determined cause. Disorder to the vertebrae of the cervical or dorsal regions, or to the upper and middle ribs, can generally be found. Traumatic influences probably affect the nerve centers, thus causing a disturbed innervation, by the direct effect of the deranged structures upon the nervous tissues.

Morbid Anatomy.—In most cases no changes have been observed in the central nervous system or in the sympathetic ganglia. Some observers have noted induration of the pons, medulla and cord, but these changes may be due to senility or to the indirect consequences of the long disturbance of function. In a few cases, interstitial sclerosis of the peripheral nerves is observed, these are probably secondary changes. The question has been raised whether the disease is of the nervous or muscular system. Osteopathic experience regards paralysis agitans as an affection of the central

nervous system, due to a disordered structure in the locality affected.

Symptoms.—The onset is usually gradual, but may come on quite suddenly at the beginning after exertion. The initial symptoms are usually tremor, stiffness or weakness in one hand. In rare cases at first there may be neuralgiac pains, dizziness and symptoms of a rheumatoid nature. The tremor can be controlled by the will at the onset of the disease, but the affection gradually extends until an entire side or the upper or lower limbs are involved. At this advanced stage of the disease, a peculiar muscular rigidity of the involved region takes place. Muscular weakness comes on at about the same time as the rigidity and the loss of power varies much in degree. The condition is most marked in the fingers and hands, whence it extends to the arms and legs. It commonly passes from the right arm to the right leg, then to the left arm, and then to the left leg. At this stage the movement between the thumb and fingers is like that of crumbling bread. The writing is greatly affected and in time it is impossible to write. The trembling may be so violent as to prevent sleeping. There is occasionally intermission of days in the tremor.

On account of the rigidity of the muscles the patient assumes a characteristic attitude and gait. The position of the body is of a tendency to go forward, the head is bent forward, the back curved outward, the arm bent at the elbow and held away from the body, and the knees so close together that they rub in walking. The gait is a "propulsive" one, and when once started in a forward walk, the patient's gait becomes more and more rapid and he cannot stop until he comes against some object. The expression of the face is stiff and mask-like, the speech slow and monotonous and the voice shrill. The patients generally are restless and troubled with insomnia. The general health is in

fairly good condition. Unnatural perspiration occasionally occurs. The intellect is generally retained, although the physical ailment may cause mental depression.

Diagnosis.—Is usually easy and can oftentimes be made at a glance.

Disseminated sclerosis has a tremor, but is shown particularly on voluntary movements. The speech is scanning and the gait ataxic. The disease begins in the lower extremities, the attitude is different from that of paralysis agitans and there is nystagmus.

In *chorea* the movements are general, irregular and more intermittent, and it particularly involves muscles of the face Also chorea is a disease of children and young adults.

Prognosis.—The disease does not necessarily shorten life, the patient oftentimes dies with some intercurrent disease. Improvements usually result from careful prolonged treatment. Early treatment, of course, will give the most satisfactory results, and quite often if taken in time the case can be cured.

Treatment.—A most careful examination of the physical structures of the patient should be made, particular attention being paid to the cervical and dorsal vertebrae, the upper and middle ribs and the muscles along the spinal column. All irregularities found should be corrected if possible, and strong thorough treatment given to the region of innervation of the affected parts. Treatment of the arms and legs involved will also be of aid. All causes of mental strain and of physical exhaustion should be prevented if possible. General hygienic measures are to be employed. The life of the patient should be quiet and regular. Bathing, fresh air, massage and out-door life will aid in improving the general health.

ACUTE CHOREA.

Synonyms.—Lydenham's chorea; St. Vitus or St. Anthony's dance.

Definition.—A functional disorder of the nervous system, chiefly affecting children, characterized by irregular involuntary muscular contractions, usually slight psychial disturbance, and there is great liability to endocarditis.

Etiology.—The disease affects children of all classes but is more common among the lower classes. The greater number of cases occur before the age of twenty. It attacks females more frequently than males. It sometimes develops during the early months of pregnancy, when it often assumes the maniacal type. Chorea is frequently associated with endocarditis and rheumatism. Fright, mental worry, sudden grief and over-study may bring on an attack. Children of neurotic stock are more susceptible. Heredity plays some part as a predisposing cause. Reflex irritation from worms or from genital irritation has a slight influence upon the disease. Derangement of the anatomical structures involving the nervous system along the spinal column are the most common causes. Most of the anatomical displacements are found in the cervical vertebrae.

Morbid Anatomy.—As yet no constant anatomical lesions have been found. Emboli have been found in some cases, but this might be expected, as endocarditis so frequently occurs as an effect and not the cause of chorea. Many claim that chorea is a functional disorder of the brain, affecting the nerve centers controlling the motor apparatus. Some say that the disturbed nerve cells is due to hyperaemia, others to anaemia, and still others to psychical influence, and to central or peripheral irritation. According to osteopathic theories and investigations, the disease is due to various irritations to the spinal centers and nerves of the affected re-

gion. The disordered nerve cells may be the result of direct pressure, hyperaemia, anaemia, etc., and the action upon the brain centers is possibly a reflex act.

Symptoms.—In the majority of cases the affection of the muscles is slight, the speech is hardly involved and the general health but slightly impaired. Marked restlessness, disturbed rest at night, crying spells, pains in the limbs, headache and irritability, are some of the premonitory symptoms. In mild cases only one hand, or the hand and face, are affected. The irregular jerky movements are characteristic of this disease. In severe cases the movements are general, the power of speech is lost, and the patient is unable to get about. The condition usually occurs after one or more mild attacks, although it may occur primarily. Maniacal chorea, or chorea insaniens, is the most serious and often proves fatal, although recovery may occur. This form occurs frequently in pregnant women. Speech is greatly affected and insomnia, fever and maniacal delirium develops. During an attack of chorea, the child's disposition changes, they become irritable, can not concentrate their mind, memory is affected and hallucinations may occur. The reflexes do not differ from the normal.

Duration.—Is from eight to ten weeks, in the average case. Mild cases may recover in a month or less, others last six or more months. There is a tendency of chorea to recur; rheumatism seems to favor this tendency. In children recovery is the rule.

Diagnosis.—In the majority of cases chorea is easily recognized. The symptoms are generally very characteristic.

Hereditary Ataxia.—Slow irregular movements, the scolioses, scanning speech, early talipes and the existence of other cases in the family, will differentiate this from chorea.

Cerebral Sclerosis.—Onset usually in infancy, impaired intelligence, increased reflexes, rigidity and chronic course of the disease, are points which render the diagnosis easy.

Prognosis.—As a rule this is favorable as nearly all cases recover. Chorea insaniens, however, is almost always fatal.

Treatment.—The causes of chorea, osteopathically, are usually found to be subluxations of the vertebrae or ribs at any point, but particularly in the cervical vertebrae. Chorea is one of the diseases of the nervous system, in which constant morbid changes are not found upon post-mortem examination. Possibly, why constant morbid changes are not found is because the lesions causing the diseased state are not deeply seated enough to primarily affect motor centers; but are lesions of the spinal column and ribs, affecting simply the nerve fibres, as they pass through the intervertebral foramina. I am inclined to believe that such is the case in many of the "but little understood" diseases of the nervous system. The osteopath certainly finds well marked lesions, and upon correction of these lesions a cure is made. What better proof could be given that such lesions are the real cause of the disease?

The muscle, or group of muscles involved, will give a direct clue to the osteopath where the lesion will probably be found. In nearly all cases, it is in the spinal region of innervation to the affected muscles. Other cases may be due to cerebral lesions, as well as to intestinal and uterine disturbances. Careful search should be made for reflex irritation, such as intestinal parasites, adherent prepuce, eye strain, etc.

All cases should be taken from school, and carefully guarded from excitement, and placed under the most favorable hygienic conditions. The more serious cases should be placed in bed, so that rest will be secured as well as diminishing the liability of heart complications.

The diet must be carefully watched and the bowels attended to regularly. If worms should present themselves, treatment is to be administered at once, to relieve the system of them. Mild gymnastics in most cases will be found of service. Amusement should be given the child, in the open air if possible. In severe cases where the skin is harsh and dry, the hot air bath, providing the strength is good, will give considerable relief from the intensity of the disease.

INFANTILE CONVULSIONS.

Synonym.—Eclampsia.

Definition.—Convulsions due to a reflex irritation in children.

Etiology.—Infantile convulsions may be due to many causes.

(1) They may precede the development of many of the serious diseases of the nervous system in children.

(2) They may occur as the result of peripheral irritation. Dentition in association with rickets, and intestinal parasites are common causes.

(3) They may be the early symptoms of acute infectious diseases. Scarlet fever, measles, pneumonia and small pox are very frequently preceded by convulsions.

(4) They may be due to debility resulting from gastro-intestinal disorders.

(5) Malnutrition is a predisposing cause.

(6) Diseases of the bone especially rickets may be associated with convulsions.

Symptoms.—In severe cases the fit may be identical with epilepsy. It is more often not so complete in its stages as true epilepsy. The attack may come on suddenly without warning or be preceded by restlessness, twitching, sometimes grinding of the teeth and fever. The attack may be

single, but the fits may follow each other with great rapidity and terminate fatally. Death rarely occurs from the convulsion itself. As in epilepsy the temperature is often raised during the fit. A transient paresis sometimes follows, if the convulsions have been chiefly limited to one side.

Diagnosis.—The diagnosis is usually easy. There is a sudden onset when the patient is in full health. The attack is probably usually due, to the ingestion of some undigestible food or to some peripheral irritation. Convulsions appearing immediately after birth or injury either persisting for weeks or months or gradually disappearing are probably due to meningeal haemorrhage or serious injuries to the cortex; although a few of these cases will present serious lesions of the cervical vertebrae. These convulsions usually occur between the fifth and twentieth months. Convulsions occurring after the second year, are more likely to be true epilepsy.

Prognosis.—This depends almost wholly upon the cause, severity and duration.

Treatment.—The first step in the treatment is to determine the cause if possible. Treatment in the region of the sixth and seventh dorsals will often give relief; then by thorough work along the lumbar region to the sacrum will many times be quite sufficient, if the convulsion is due to intestinal disorder. It may be necessary to vomit the patient, when it is due to undigested food in the stomach; and in some cases an enema should be used when the irritation is in the intestines. In a few cases when the convulsions are due to dentition, a lancet applied to the gums will be all that is required. A thorough treatment to the cervical region, to control the circulation should always be given, at the same time apply ice to the head. Placing the patient in a warm bath, 95 to 98 degrees F., should be performed, if the preceding treatment does not have direct effect.

EPILEPSY.

Synonyms.—Mobus divinus; falling sickness; falling fits; idiopathic epilepsy.

Definition.—A chronic affection of the nervous system characterized by attacks of unconsciousness which are usually accompanied by general convulsions.

Etiology.—Epilepsy usually begins before puberty, and very rarely after the twenty-fifth year. Females suffer somewhat more frequently than males. Heredity predisposes to the disease to some extent, but probably not so greatly as many writers would claim. Neurosis, as insanity and hysteria, and intermarriage of relations, are important elements to consider. When epilepsy is inherited it is almost always due to some morbid state of the nervous system. Other predispositions to the disease may be caused from defective general development of the brain, from impairment of the general health, and from an exhausted nervous system.

Many exciting causes may be found: mental emotion, fright, excitement and anxiety; blows and injuries to the head; infectious diseases; syphilis; alcoholism; masturbation; ocular and aural irritation; disturbed and delayed menstruation. Epilepsy may be caused by reflex convulsions, from intestinal worms, gastric irritation, etc. Also thickening of the membranes of the brain, pressure from a tumor at the periphery, uterine diseases and many other sources of irritation may be found, that are the exciting causes of epilepsy.

The true exciting causes of epilepsy are, undoubtedly, in many cases, due to lesions of the vertebrae and ribs. Especially the vertebrae of the cervical region when deranged, are apt to be an exciting cause of epilepsy; although in a number of cases I have seen the lesion in the lower splanchnic region or in the ribs (chiefly from the fourth to the

eighth). Possibly these lesions or obstructions to the spinal cord cut off the nutrition to the vasomotor nerves. If the real seat of the disease is in the cerebro-cortex and the medulla, the cervical lesion and in fact other lesions could readily affect the nerve force to and from these regions; or the vertebral circulation, where a cervical lesion exists, may be involved and affect the brain. In cases where lesions of the vertebrae and ribs exist in the upper and middle dorsal region, the vaso-motor innervation to the brain may be involved, for in this region the vaso-motor nerves to the cranium, etc., pass from the cord into the sympathetics.

I remember some time ago of having a case of epilepsy that was evidently caused by a dislocated right fifth rib. By producing an irritation in the region of this rib, so that the lesion was increased, the patient could be made to immediately suffer from an attack of epilepsy. By re-setting the rib, at once the sufferer would be entirely relieved. The case was cured after three months' treatment, the chief work being to keep the rib in place. Rarely a subdislocated innominate bone, or some lesion remote from the brain, is located that is causing epilepsy. A large majority, however, of all lesions causing epilepsy will be readily located in the cervical region.

After one fit has occurred others readily occur owing to the proneness to changes in the nerve centers. Very little is known as to the pathology of this disease. Convulsions may be caused from irritation of both the cortex cerebri and the medulla oblongata. From a study of the character of the aurea one is led to believe, that there is a disturbance in most cases in the centers of the cerebral cortex; and that the lesions so generally found along the spinal column are the true exciting causes of the disease. Perhaps in a few cases the irritation may be to the medulla reflexly. The lesions found on osteopathic examination may act re-

flexly upon the centers in the brain and excite them; or the circulation is deranged, and consequently the nutrition to the brain and meningitis, by vaso-motor control and the vertebral vessels, is impaired.

Morbid Anatomy.—Constant anatomical lesions are not found. The appearance of the nerve centers to the naked eye is largely that of healthy organs. In a few cases there may be some thickening of the meninges. The changes revealed by the microscope are those most probably of secondary origin.

Symptoms.—These will be considered under the four varieties, known as grand mal, petit mal, Jacksonian and psychical epilepsy.

Grand Mal.—In most cases the seizure is preceded by a pronounced and peculiar sensation known as the aura. The aura differs greatly in various individuals. It may begin in a finger or toe and rises until it involves the head, when the patient screams and falls to the floor unconscious. In other cases the sensation may start from other parts of the body, as the epigastric region where it may simply be a slight discomfort; or other sensations may be felt, as that of a ball rising from the stomach. The aura may start from any part of the body as a numbness, tingling, chilliness, etc. Aura may be manifested through the optic, olfactory, auditory and gustatory nerves, by the nature of flashes, smells, sounds and tastes. "Intellectual aurae" may be also manifested.

Some form of aurae are met with in nearly one-half the cases of epilepsy. Generally, others lose consciousness so early that the patient is not aware of the onset. In cases not attacked suddenly and not preceded by an aura, a prolonged prodrome may be present for several hours or a day. The patient may feel irritable, dizzy or dispirited. Or he may be quiet and calmly await the attack. In a few cases certain movements may precede an attack, as running rapid-

ly forward in a circle, or standing on the toes and rotating rapidly. The attack proper is sudden. The patient falls suddenly with a peculiar cry. The convulsion or fit may be divided into three stages, that of tonic spasms, of clonic spasm and of coma.

The Tonic Spasm.—Succeeding the epileptic cry, there is loss of consciousness, pallor of the face and the pupils are contracted. The body assumes a position of tetanic rigidity, the head is retracted and rotated, and the spine curved owing to an unequal affection of the muscles of the two sides. The jaws are fixed, the arms are flexed at the elbow, the hands at the wrist, and the fingers are clinched. The legs and feet are extended. The muscles of the chest are involved and respiration is suspended. This stage lasts but a few seconds.

The Clonic Spasm.—Following the tonic spasm the muscular contractions become intermittent. From slight vibratory motions, the intermittent muscular contraction becomes general. The arms and legs are thrown about most violently, the muscles of the face are distorted, the eyes rolled, and the lips open and close. The muscles of the jaw contract violently and the tongue is apt to be bitten. The pupils are dilated, the face cyanosed and blood streaked, frothy saliva pours from the mouth. The faeces and urine may be discharged involuntarily. The temperature rises about one degree F. This stage lasts about one or two minutes.

Coma.—The period of coma may last from a few minutes to several hours. Usually if left alone the patient will awaken after a few hours, in a natural state, feeling somewhat bruised, but otherwise quite well. In a few cases mental confusion follows the waking. During the stage of coma, the face is congested but not cyanotic. The muscles are relaxed and the breathing is noisy and stertorous.

Petit Mal.—In this variety of epilepsy convulsions are absent. The seizure consists of momentary unconsciousness with fixed, staring eyes, dilated pupils and rarely any twitching of the muscles. After the attack the patient resumes his work again, or whatever he has been doing as though nothing had happened. There may be attacks of vertigo without unconsciousness and the patient may fall. In a few instances there may be aurae of various kinds. Petit mal may be a fore-runner of grand mal or the two forms of attacks may alternate.

Jacksonian or Partial or Cortical Epilepsy.—In this variety, the affection is always symptomatic, of some local lesion of the motor area of the cortex. The lesion is quite apt to be a tumor, though various injuries, inflammation, sclerosis, softening, haemorrhage or an abscess may be the cause. Consciousness is retained and the convulsions are limited in extent, to a single muscle or a group of muscles, or to a limb or half of the body. Tonic and clonic spasms of the same character as in general epilepsy occur. A slight numbness, tingling, or twitching may precede the attack.

Psychical Epilepsy.—This form may occur independently; in it, the usual convulsion is replaced by a somnambulistic state, and various acts may be performed by the patient. It may be a symptom following the forms of grand mal and petit mal.

The severity of epilepsy varies extremely. The seizure may occur but once a year or it may occur several times in a day. In many cases a marked periodicity is observed. The mental functions are not as a rule injured, but when the seizures are frequent, the health fails and the mental capacity is reduced.

Many sufferers from epilepsy are subjects of chronic gastric catarrh, and have at the same time an inordinate appetite. Occasionally a fit may follow inordinate eating.

When there is a series of convulsions, which follow one another in rapid succession and which are associated with high fever, the term "status epilepticus" is applied. The most common form of epilepsy is the major form. About two-thirds of all attacks occur between eight a. m. and eight p. m. When attacks occur in the night the name nocturnal epilepsy is given it.

Diagnosis.—Uraemic convulsion closely resembles an epileptic convulsion. When the history of the case, analysis of the urine, increased temperature and the general health of the patient are all closely observed, error should be avoided.

In reflex convulsions of children a careful search and if necessary waiting a short time will readily determine the source of the attack. When nocturnal convulsions occur without the knowledge of the patient, the attack is epileptic.

In hysterical convulsions the patient rarely loses consciousness. She rarely hurts herself, never bites her tongue, the temperature is normal, opisthotonos does not occur, and the duration usually lasts longer.

In Jacksonian epilepsy, the attack is limited to some portion of the body, or it may gradually extend into a general convulsion. In a large majority of cases it is due to syphilis.

Prognosis.—About forty per cent. of all forms combined, have been cured at the A. T. Still Infirmary. A much larger percentage (about seventy-five per cent.) have been considerably benefited.

The pure nocturnal, and diurnal forms are more easily cured than mixed forms. The chances of recovery are greater in the young. An epileptic rarely dies of his disease; but epileptics as a rule do not live over fifty years. Mental deterioration, and tuberculosis are somewhat common occurrences in epileptics.

Treatment.—Osteopathic treatment has been especially successful in epilepsy, as compared with other treatment. Although the osteopaths do not claim a cure, in every case, by any means, still about four out of every ten have been cured, while one-half of the remaining have been greatly helped in regard to the lessening of the severity of the attack, and in rendering the attacks less frequent.

The primary lesion is usually found in the cervical region, from the third to the seventh vertebra, still it may be as high as the atlas. These lesions may affect the brain in various ways, possibly in the manner described under the etiology. Occasionally lesions are found in the dorsal vertebrae or in the ribs. When occurring below the cervical region, the lesions are generally found in the middle dorsal region. Still lesions may be found at any point along the spinal column.

The treatment is according to the rule that applies to all osteopathic work; an individual correction of the lesions, presented in the case at hand. If any general movement, or treatment might be given, it would be strong traction of the head to stretch the cervical vertebrae, or rather separate them so that the circulation to the brain may be equalized.

If the lesions in such cases are in the cervical vertebrae, possibly they affect the cervical sympathetic. A careful search must be made throughout the entire body for a source of excitation. An irritation of the intestinal tracts may be the exciting cause; or some irritation of the genito-urinary tract may be found, as phimosis, masturbation, etc., so that it is very necessary that great care be taken in the examination. Subjects of masturbation usually present lesions along the genito-urinary center in the spine.

The proper hygienic measures should be added. Pay particular attention to the bowels. Baths are important and plenty of fresh air, and out-door exercise is of much signifi-

cance. The patient's mind should be occupied. The question of food is an important one; general diet, carefully regulated—as to the amount given—should be prescribed. The patient must not be allowed to eat too much at a time, nor too often.

In most cases of true epilepsy a continued treatment of several months is necessary. Unless the patient can follow out the treatment for several months, or even years, in a number of cases, it will be entirely useless to take the treatment; although if the lesion present is very apparent, and the patient is enjoying fair health otherwise, and has not been affected long, a treatment for a few months, or even weeks might be all that is necessary.

Surgical interference is usually indicated in Jacksonian epilepsy. Trephining has been practiced successfully in a number of cases. The risk from operation, with modern surgery is so reduced that one is justified in performing an operation.

During an attack, a special treatment cannot be given to lessen the severity of the fit in all cases. In some cases, at the beginning of the seizure, exerting a firm pressure upon the sub-occipital will quiet the patient. This treatment probably controls the circulation of the brain, by way of the superior cervical sympathetic ganglia. In cases where the exciting factor seems to be in the intestines, and the peristaltic action of the bowels is reversed, causing a reversion of the nerve current of the vagi, a rapid firm kneading over the abdomen, so as to establish normal peristalsis will suffice to prevent an attack, if one is notified of its approach. Also in some cases a rapid, thorough stimulation of the solar plexus will lessen an attack. Possibly it reduces the blood pressure in the brain, by bringing blood to the splanchnic region.

In all cases during the convulsion the patient should be

carefully protected from injuring himself. A towel should be twisted and placed in the mouth, so that the tongue cannot be bitten. Do not place small articles as corks, etc., between the teeth, as they are liable to enter the pharynx, and cause suffocation. The patient should be controlled enough to protect him from any injury, and otherwise the attack be allowed to spend itself.

MIGRAINE.

Synonyms.—Paroxysmal headache; sick headache; bilious headache; blind headache; megrim; hemicrania.

Definition.—A paroxysmal pain in the head, usually unilateral and periodical, associated with nausea, vomiting, derangement of vision and temporary disturbances of the brain.

Etiology.—The disease usually begins in the first half of life, rarely earlier than puberty and slightly more frequent in females. Late childhood, puberty and early adult life are the principal periods of the disease. Some weakened or depressed condition of the nervous system is generally the cause, such as lesions of the upper cervical vertebrae, lesions of the inferior maxillary, anxiety, over-fatigue, anaemia, digestive derangements, eye-strain and menstrual disorders.

It is supposed by some to be a vaso-motor disturbance, because there are symptoms as pallor and flushing of the skin, which show an involvement of the sympathetic system. It is possible a spasm of cerebral arteries followed by vascular dilatation takes place. The seat of the pain is believed to be in the mininges of the brain. Possibly in many cases where the atlas is found involved and causing the affection, some meningeal fibre of the fifth nerve is impinged by the lesion. Caries of the teeth and nasal troubles are causes of the disease in children.

Symptoms.—A paroxysmal headache is the essential feature of migraine, the attack may occur without warning,

although there is malaise, restlessness and a disturbed vision preceding the headache, the prodromal symptoms vary to a great extent. They are generally so familiar to the sufferer that he can tell the approach of an attack. Other prodromal symptoms besides those given, may be vertigo, spots before the eyes, tinnitus, chilliness, etc. The pain is of a sharp and stabbing nature and is oftentimes limited to the temporal region of one side. Others describe the pain as of a blinding or of a boring nature. It is continuous and may be also in the occiput, instead of in the side of the head, and it may even extend to the half or whole head.

The extreme hyperaesthesia of the surface is noticed, but the tender points of neuralgia of the fifth nerve are absent. The patient is sensitive to light and noise and a darkened room is usually sought. Flashes of light occasionally attend the pain in the head. Hemianopia is not infrequent. The temporal artery may be contracted, the face pale and the pupil large. In others the eye is dilated, the face flushed and the pupil small. Nausea and vomiting are frequent. There is loss of appetite. In some cases where the stomach is full vomiting of its contents will relieve the attack. Should the stomach be emptied, vomiting of mucus may occur, which is later followed by vomiting of bile, whence the term "bilious headache." Extreme soreness and tenderness is commonly found about the region of the occipital and upper cervical muscles.

Occasionally cramps of the facial muscles, tingling or numbness in one hand, paresis of the ocular muscles and partial aphasia occurs. On the affected side an arterial capillary fibrosis sometimes takes place; this gives additional support to the vaso-motor theory of origin.

Attacks rarely occur oftener than once in ten or fifteen days. In a large number of cases the attacks occur about once a month. During the intervals the patient may be

quite well. The duration of an attack is anywhere from a few hours to several days.

Diagnosis.—The sensory symptoms, the paroxysmal character, the severity and definite course usually quite readily distinguishes migraine.

Growths of the brain may be the cause of symptoms closely simulating migraine. In such cases an opthalmoscopic examination may reveal a choked disc.

Prognosis.—Is usually favorable when the attacks are light and of short duration. Cases of long standing and of great severity are not so easily cured, although in most instances great relief can be given the patient. There are very few cases but what can at least be lessened in the severity and frequency of attacks. Oftentimes attacks of migraine cease after middle life.

Treatment.—The atlas or one of the upper cervical vertebrae are almost invariably subluxated. This is not always the direct cause of migraine, but it is an important factor in the causation. During the attack many cases can be completely or at least partially relieved, by a careful judicious treatment in the upper cervical region. But I have known, of a number of cases, that treatment of the cervical region would be entirely unsuccessful, and, in fact, aggravating to the attack. The details of treatment vary in every case. If any defects in general health can be found or any error in the mode of living, these of course must receive first attention. Rest, diet and regularity of meals are usually to be specially considered. Anything that is known to induce an attack must be carefully avoided. I have had cases where the attacks have ceased as long as they remained free from mental work, but as soon as they returned to their studies the paroxysms occurred.

Every case should be thoroughly examined and investigated before a course of treatment is laid down. Causual

conditions can generally be easily found, and the correction of such, usually results in a cure or at least in great relief. Errors in diet, digestive disturbances as a disordered biliary tract, disorders of the pelvic organ, eye-strain, a spinal lesion, particularly in the upper or middle dorsal region, mental and physical fatigue and affections of the nose may induce attacks.

The earlier the treatment the more likelihood of a cure. Cases of long standing are generally harder to cure. Preceding a paroxysm, relief can usually be given, but after the paroxysm has reached its height it is harder to give relief. The patient should rest in a quiet room which is darkened and well ventilated. Besides the indicated osteopathic treatment, generally a cervical one, hot applications to the nape of the neck and keeping the extremities warm are helpful. The nerves involved are the vaso-motor, occipital, frontal and temporal. A free evacuation of the bowels will relieve a few cases. During the intervals, valuable adjuncts will be found in the use of systematic exercises and frequent bathing.

OCCUPATION NEUROSES.

Synonyms.—Professional neuroses; artisan's cramp; copodyscinesia.

Definition.—A group of maladies of the nervous system, characterized by symptoms excited by an attempt to perform some oft repeated muscular act, commonly one involved in the occupation of the patient. The most common symptom is spasm or a cramp in the part concerned. Pain is usually present and may be referred to certain nerves, muscles, bones or joints. Therefore we may have a motor or sensory form, or the two are often combined.

Varieties.—Writers' cramp; telegraphers' cramp; piano players' cramp; typewriters' cramp; violin players' cramp; seamstresses' cramp; dancers' cramp and milkers' cramp.

Etiology.—There is no predisposition in sex. A nervous temperament predisposes to the development of the affection. Previous injuries and strains of the involved parts, are important factors in the predisposing causes. Faulty methods in writing, and in the other disorders, a strained or cramped position of the affected tissues, predisposes to attacks. Slight lesions of the bones, joints, ligaments and muscles are commonly found, involving the motor and sensory nerves of the immediate locality. The majority of all cases occur between twenty and fifty years of age.

Morbid Anatomy and Pathology.—Distinctive anatomical changes have never been discovered. Each case has particular lesions of its own. As in all diseases, the details of the case are characteristic of the one case only. The affection is most probably primarily a spinal one, due to the deranged action in the spinal centers concerned in the various acts. Such derangements are caused by impingements of the anatomical structures upon the spinal centers and fibres controlling the affected region.

Symptoms.—Symptoms of the various varieties of professional neuroses develop gradually and slowly. A cramp or spasm is an early symptom which affects the used member. In writers' paralysis there may be a combined movement of flection and adduction of the thumb so that the pen may be twisted from the grasp. Tremor, stiffness, fatigue and heaviness of the affected member are present most of the time. Weakness and debility of the muscles develop until paresis and paralysis may occur with a spasm, or alone. Abnormal sensations are generally present upon using the affected muscles. The abnormal sensations consist of a tired feeling, numbness and soreness or even pain. There may be local tenderness or tingling sensations. In some cases the pain is neuralgic, or a sub-acute neuritis may develop.

Vaso-motor disturbances are present in severe cases. Hyperaesthesia, a local asphyxia giving the tissues a chilblain-like appearance, and a glossy skin are manifested. The arm and hand may become blue and hot in attempting to write. Associated with the inability to perform the usual work may be mental worry and depression.

Diagnosis.—The history of the case and the limitation of the disease to one member, usually makes the diagnosis easy. Cerebro-spinal diseases, as hemiplegia, early tabes affecting the arms, and progressive muscular atrophy have to be carefully excluded. Occasionally nervous persons imagine they have the disease, and complain of weakness or stiffness, without showing any characteristic disturbances.

Prognosis.—As a rule is favorable. Osteopathic treatment in the majority of cases treated has performed a cure.

Treatment.—Rest of the part, mental quiet and attention to the nutrition of the patient, are necessary considerations to be attended to, first. The treatment consists of a correction of the parts, irritating or impinging the spinal centers or nerves affected. The ulnar, radial and median nerves all innervate muscles employed in writing. Lesions of the cord affecting these nerves may be found from the fifth cervical to the sixth dorsal. In a few cases lesions occur as high as the atlas. When the radial and median nerves are involved the lesions are principally found in the upper dorsal vertebrae. When the ulnar nerve is involved the lesions are usually slightly lower. The lesions may affect the fibres of these nerves directly (mechanically), but more probably the vaso-motor nerves are involved. As in this region the vaso-motor fibres to the arm pass from the cord to the sympathetic fibres. The brachial plexus really originates higher than the upper middle dorsal region.

Other lesions affecting the arms are oftentimes found in the ribs on the side involved. Any one of the first five ribs may become deranged and affect the innervation of the arm. The clavicle in a few cases may be abnormally low. Occasionally slight sub-dislocations of the shoulder joint (especially anterior) and elbow joints are found. Gymnastic exercises of the arm and hand, coupled with a general treatment of the shoulder, arm and hand is beneficial. Hydrotherapy, massage and friction of the involved member are useful.

TETANY.

Synonyms.—Tetanilla; intermittent tetanus.

Definition.—A nervous affection of unknown cause, characterized by continuous or intermittent tonic spasms of the extremities, usually bilateral, but occasionally involving only one limb, rarely becoming general.

Etiology.—It most frequently occurs in children. It is most common in the winter months and especially on the continent of Europe, but is rare in this country. It is frequently associated with infectious diseases, laceration, pregnancy, chronic diarrhoea, dilatation of the stomach and intestinal parasites. It may follow removal of the thyroid gland. Tetany is occasionally excited by exposure to cold and wet, on account of which, it is sometimes called rheumatic tetany.

Symptoms.—The spasm is usually limited to the hands and feet. The thumb is contracted in the palm of the hand, the fingers firmly bent at the metacarpo-phalangeal articulation, but extended elsewhere, and pressed close together. The wrist is flexed, the elbows bent and the arms are folded over the chest. In the lower limbs the feet are extended and the toes adducted. The jaws are rarely involved. The contractions are paroxysmal and are always associated with

pain, which may be extreme or there may be tenderness. The spasms last for a variable time from a few hours to several days, sometimes only a few minutes. There may be slight oedema.

Trousseau's Symptoms—"so long as the attack is not over the paroxysms may be reproduced at will. This is effected by simple compression of the affected parts, either in the direction of their principal nerve trunks or over their blood vessels, so as to impede the venous or arterial circulation."

Chvostek's symptom is a peculiar excitability of the motor nerves so that spasms are produced by tapping along the course of a nerve.

Erb's symptom consists of increased electrical excitability.

Diagnosis.—As a rule the diagnosis is easy. The severer forms are occasionally confounded with tetanus. In tetany the spasm begins in the extremities and rarely affects the muscles of the jaw.

Hysterical contractures are unilateral as a rule.

Prognosis.—The prognosis is usually favorable. Cases associated with dilated stomach and thyroidectomy may prove fatal.

Treatment.—The principal treatment is a correction of the disease with which tetany is associated. Careful examination in the region of the nerves affected should be made, for lesions of the vertebrae, ribs, and deeply contracted muscular fibres. Baths, cold sponging and the spinal ice bag are recommended. It is necessary that the patient should have the most favorable hygienic surroundings and plenty of nutritious food. In cases of pregnancy the condition usually persists until confinement.

The treatment of tetany, like many other diseases, requires special work to locate the cause. The osteopath is

simply obliged to examine carefully all tissues that may become disordered and excite the disease.

HYSTERIA.

Hysteria is a nutritional disorder of the nervous system, manifested by symptoms of every variety, and associated with impairment of will power and increased emotional tendencies.

Etiology.—The term, hysteria, is an erroneous one. The affection was supposed to be due to disturbances of the female sexual organs, hence the term was derived from the Greek word for womb. The occurrence of hysteria is largely influenced by race and civilization. It is practically unknown among the barbarous races and is of rare occurrence in Northern races. The disease frequently occurs among the Southern races.

The affection is found chiefly in women. About twenty women have hysteria to one man. In male subjects the disease is more of a *hypochondriasis.* Hysteria is most common in early adult life; although old maids, widows and childless married women are frequently affected with the disease. The character of the nervous system in the female is probably why the disease occurs oftener than in the male, and not on account of the possession of certain sexual organs.

Heredity is an important factor in the cause of hysteria. Oftentimes the disease is transmitted through hysterical, epileptical or insane parentage. Simply a general neurotic tendency may be an unquestionable cause of hysteria.

The direct causes of hysteria may be many, and include physical and mental influences, or both. Traumatism of various regions of the body, but especially of the spinal column, may excite hysteria. Some slight lesion of a vertebra or rib may be all that is discoverable. A correction

of the same is occasionally all that is necessary to remove the direct cause. Prolonged emotional excitement, defective education and many moral and mental influences are potent and frequent causes. Masturbation or an adherent prepuce occasionally are causes of the affection in boys. Disturbances of the sexual system in both sexes are responsible for many cases. At the menstrual period and the menopause are frequent periods for the manifestation of the disease. The disease commonly affects prostitutes. Disturbances of the digestive, nervous and circulatory systems, and general diseases of an exhaustive kind are exciting causes of hysteria. Dr. Still says that occasionally the colon is prolapsed and crowded down upon the pelvic organs.

Symptoms.—The symptoms may be extremely varied, including any symptom of the many nervous diseases.

Sensory Disorders.—The sensory symptoms are varied. The most common is anaesthesia, which may be found in certain parts of the body, usually one side of the body. The patient may not know of the sensory derangements until discovered by the physician. When there is anaesthesia without other nervous symptoms, the case is commonly hysterical. The most marked symptom is analgesia, where the patient is insensible to painful impressions. A pin may be placed deeply into the flesh, and be unfelt by the patient. The anaesthesia may extend to the mucous surfaces, and even deeply down to the tissues of the joints. There may be other symptoms of disturbed sensation; as an absence of pressure, temperature and muscular sensation.

Hyperaesthesia may be present nearly as often as anaesthesia. Hyperaesthetic areas may be found in various regions of the body, but especially along the spinal column and in the ovarian region. The "hysterical spinal irritability" is of special interest to the osteopathist. The spinal

column may be affected as a whole; or in segments; or confined to a single vertebra. Especially when a spinal irritability is in segments; or confined to a single vertebra; are local derangements of the spinal column apt to be found. Correction or even pressure upon these areas; will often relieve the patient. Severe pain over the heart may simulate angina pectoris. *Globus hystericus* is of quite a common occurrence.

Charcot refers to the ovarian hyperaesthesia as follows: "It is indicated by pain in the lower part of the abdomen, usually felt on one side, especially the left, but sometimes on both, and occupying the extreme limits of the hyperaesthetic region. It may be extremely acute, the patient not tolerating the slightest touch; but in other cases pressure is necessary to bring it out. The ovary may be felt to be tumefied and enlarged. When the condition is unilateral, it may be accompanied with hemianaesthesia, paresis, or contracture on the same side as the overalgia; if it is bilateral, these phenomena also become bilateral. Pressure upon the ovary brings out certain sensations which constitute the *aura hysterica*, but firm and systematic compression has frequently a decisive effect upon the hysterical convulsive attack, the intensity of which it can diminish, and even the cessation of which it may sometimes determine, though it has no effect upon the permanent symptoms of hysteria."

The special senses may be disturbed, although they are usually transient. There may be blindness, narrowing of the field of vision, due to anaesthesia of the periphery of the retina, loss of hearing, loss of smell or loss of taste.

Motor Disorders.—Different forms of paralysis may result as hemiplegia, paraplegia or monoplegia. In fact all forms of paralysis may be found in hysterical patients. The affected muscles do not atrophy. The paralysis is usually

general, and contractures are common. Local paralysis as of the bladder, vocal cords and other parts of the body commonly occur.

Contractures and spasms may also occur. True epilepsy may even be simulated by hysterical spasms, but on careful observation, the characteristic attack of epilepsy is found wanting. Firm pressure may increase the severity of attack as well as to bring it on. The spasms are of various parts of the body, as of the diaphragm, bronchi, abdominal muscles, bladder, etc.

Visceral Disorders.—Various disturbances of the viscera may occur. Of the digestive tracts, the appetite may be disturbed or depraved. Diarrhoea or constipation may be present. Flatulency is a common symptom. The respiratory tract may be another point of considerable disturbance, in many cases. Dyspnoea, aphonia, hiccough, cough and an exaggerated breathing, as when cold water is poured on one, are common manifestations. Various cardiac vascular symptoms may be manifested, especially a rapid heart.

Psychical Disorders.—Psychical manifestations, as lack of will power and an excitable nature—easily moved to laughter or tears—are frequent. The moral tone may be lowered. Even delirium, catalepsy, ecstasy and trance, may be mentioned among the psychical phenomena.

Hysterogenous Zones.—These zones are of more than passing interest to the osteopathic physician. Tyson writes as follows, in regard to the hysterogenous zones: "These are hyperaesthetic areas especially studied by Richet, on which persistent pressure will sometimes excite a hysterical attack. While the ovaries are favorite hysterogenous zones, the zones may be in any part of the body; as, for example, the sides of the trunk. Such pressure may also cause an existing attack to subside. Hysterical spasms may also be localized or limited to groups of muscles." Especially when

zones along the spine, and side of the trunk are located, the attack of hysteria may be completely relieved by correcting the localized deranged tissues.

These are part of the many manifestations, that are presented by various hysterical patients, and it is readily seen, a physician has to be continually on his guard.

Diagnosis.—The diagnosis is generally quite easy. The characteristic emotional symptoms, associated with any of the many other symptoms, which have no organic lesion; is quite characteristic of the disease. Care has to be taken, though, in some cases where symptoms are presented, which have organic lesions. The history, the attack and neurotic temperament, will largely decide the nature of the affection.

Prognosis.—Death may occur from exhaustion, but such a termination is rare. Recovery is the rule, although the duration may be long. Recovery usually rapidly takes place, as soon as the cause can be determined and removed.

Treatment.—First of all the physician should have due appreciation of the nature of the disease. It is not always necessary to be harsh and severe with the patient; but one should be firm and unyielding. The physician can do a great deal, by having complete mental control of the hysterical patient. A most careful examination should be made for an exciting cause, and when found it should be removed. This naturally constitutes a very important part of the treatment. The general health, especially attention to the bowels, should be carefully attended to. The diet, exercise and amusement of the patient should receive due consideration. One has to gain the confidence of the patient, and then be firm but kind with them.

The "rest cure" as introduced by Weir Mitchell, is applicable in severe cases. This method consists of plenty of food, especially milk, absolute rest of the body and mind, massage and electricity with isolation of the patient, from

friends and sympathetic relatives. A general osteopathic treatment, I believe would be much better than massage and electricity.

During the hysterical convulsions the patient should be carefully watched, but extreme measures should not be practiced. Throwing cold water in the face, or a cold bath, may produce the necessary mental shock. Pressure over the ovary; as stated under hysterogenous zones, or some other zone of the body, or pressure upon a large blood vessel, as a carotid, will oftentimes stop an attack.

NEURASTHENIA.

Synonyms.—Nervous weakness; nervous exhaustion; nervous prostration; spinal irritation; encephalasthenia; the American disease.

Neurasthenia is more a fashionable term than a definite disease. There being a wide range of nervous symptoms, that are due to a deficiency of nerve force, it is a very convenient term for the physician to use to cloak his ignorance. The average physician being consulted in regard to a train of nervous symptoms, which he does not understand, and particularly when a spinal column presents an irritable and tender state from no discoverable cause, is apt to term the condition one of neurasthenia, neither the physician nor the patient being the wiser. In a word, it is a term often used merely as a "scape goat," as far as any real knowledge of the case is concerned.

It seems a fact that the average "nervously weakened" patient delights in having his case "called" neurasthenia, and possibly the ignorant physician often takes advantage of the situation.

This general nervous sensitiveness of the patient, with its many signs and symptoms, is usually quite easily understood by the competent osteopathist. He observes beyond the

mere fancies, symptoms and morbid conditions of the patient, and seeks a demonstrable cause of the affection. He never mistakes in locating the tender and irritable points along the spinal column. When such are found, he at once knows that the nervous prostration is due to local spinal lesions that are impinging; or irritating the spinal nerves; and that the many, and extensive nervous symptoms, are the result of sympathetic radiation from the local disorders.

The affection is usually found in that class of people who are predisposed to hysteria. The predisposition may be inherited or acquired. Many of the exciting causes that produce hysteria will cause neurasthenia. Various lesions along the spinal column, chiefly in the cervical and upper dorsal regions, include the predisposing causes of a large majority of sufferers. This spinal irritation taken in conjunction with over-strain of mind and body, or probably in most cases the spinal irritation, as the predisposing cause of the over-strain, results in the nervous exhaustion. Particularly over-work; associated with care and anxiety, are exciting causes of great significance.

The neurasthenic patient is generally of a neurotic temperament. The affection may also result from various chronic diseases, sexual excesses, alcohol and tobacco. The symptoms are dependent to a greater, or less extent upon spinal, cerebral, cardiac and gastric disturbances, but all of these conditions are usually dependent upon vertebral and rib lesions, of the upper dorsal and cervical regions. The lesions in the vertebrae are generally slight lateral deviations, in the ribs upward displacements of the vertebral ends, followed by contraction of the deep muscles in the neighborhood of the lesions. A posterior condition of the atlas and a lateral lesion, between the third and fourth dorsal, are especially apt to be found.

These various lesions probably cause an impairment of nutrition, in the nerve-centers of the cord and brain, or both. Definite morbid anatomical changes have not been found resulting from nervous debility or irritability. Still it seems quite possible that certain changes in the nerve-cells; may result from excessive functional activity.

Symptoms.—To enumerate the many symptoms of neurasthenia in detail is hardly necessary. The nervous debility may affect any organ of the body, owing to the exhaustion of the nervous energy, thus lessening the functional activity of that organ.

The most noticeable symptoms, are various sensory symptoms and muscular weakness; dependent upon the spinal lesions. The patient generally feels weak and tired. Headache, pains in the back and sacrum, tender points along the spine, and various sensations of numbness, tingling, etc., are felt.

The mental faculties are oftentimes irritable and weak. An inability to concentrate the thoughts, depression, fear, vertigo and many other mental symptoms, may be manifested.

Palpitation, irregular action of the heart, and pain over the præcordia may be present. Ocular disturbances, visceral symptoms of many kinds, and vaso-motor phenomena; as chilliness, flashes of heat and sweating are among the many symptoms, of which the patient complains.

Genito-urinary disorders in the male, and ovarian and uterine irritation and painful menstruation in the female, are occasionally dreaded symptoms of the sufferer.

Of any symptoms or signs of great importance to the osteopath in neurasthenia, as in many other diseases, are the tender points along the spinal column. They give direct clues as to where the lesion may be found.

Diagnosis.—Error in diagnosis can usually be prevented by a study of the history of the case, and the symptoms. Care must be taken in determining between symptoms of organic diseases, and the symptoms of a true nervous exhaustion.

Prognosis.—Is almost invariably good. Only in cases where there is a tendency to mental disorder, should the prognosis be guarded. It usually takes some time to perform a cure among the poorer class, as the requirements demanded for a cure are oftentimes expensive. Fortunately, however, most cases of neurasthenia are among the rich, who can well afford to meet the requirements.

Treatment.—Naturally the treatment, outside of the manipulation to correct the various lesions found, is extremely varied; owing to the many exciting causes and symptoms to contend with.

As has been stated, the lesions are usually found in the upper spinal region, still lesions are occasionally located in the lower spinal region, especially in female sufferers, when the pelvic organs are disturbed. The many mental symptoms, as inability to concentrate the mind, insomnia, vertigo, headache, etc., are best treated through the cervical region, with attention to the heart's action and the excretory organs. Careful attention should be paid to the deep posterior muscles; between the atlas and occipital bones.

Rest is very necessary. Changes of scene and occupation, attention to the surroundings, careful dieting, hydrotherapeutic measures, pleasant companions, relief from responsibility, bathing, etc., should receive careful attention and consideration by the physician. Set rules cannot be given. The details of treatment that may be adopted, are quite dependent upon the individual case. Every well trained practitioner will be familiar with such measures.

Careful attention must be given to the secretions, excre-

tory organs and the circulation. A study of each case will bring out the various irregularities that may exist.

When the nervous condition is extensive a "general treatment" may be given. Such a treatment would effect the entire nervous and muscular system, and tend to equalize disturbed nerve force. Bringing the muscular system into play, and relaxing contracted muscles calls for more blood and nerve force, and a consequent nutritious diet.

The "rest cure," as introduced by Dr. S. Weir Mitchell, may be employed to considerable advantage in many cases. The diet should consist principally of milk at first, followed in a few days by soft boiled eggs, boiled rice, lamb chops, graham bread, stewed fruits and butter, and a little later by roast beef, vegetables and light puddings. Tea, coffee and alcohol should be avoided.

During the entire course of the treatment, care should be taken to correct any lesion that may bear directly upon the cervical sympathetic, the solar plexus and the hypogastric plexus, as they are the great reflex centers of the body.

VASO-MOTOR AND TROPHIC DISORDERS.

RAYNAUD'S DISEASE.

Synonym.—Symmetrical gangrene.

Definition.—A condition probably due to vaso-motor disturbances and characterized by three grades of severity, local syncope, local asphyxia and local gangrene.

Local Syncope.—Exposure to cold, or severe emotional disturbances may bring on an attack. It is most frequently seen in the extremities, producing what has been called dead fingers and toes. One or more of the fingers are usually affected, although the whole hand may be affected with the fingers. The part affected becomes white and cold,

with loss of sensation. This is gradually followed by a reaction and the fingers get red, hot, and tingle. The change does not occur at the same time in all the fingers; one finger may be white, and the one next to it red.

Local Asphyxia.—This usually follows local syncope, but it may come on independently of it. It affects the fingers and toes most frequently. The tips of the nose, and helices of the ears may also be affected. The affected part is swollen, dark red and painful. Sometimes there is marked anaesthesia. These attacks may recur for years without further effect. The attack may be brought on by slight exposure to cold.

Local or Symmetrical Gangrene.—If local asphyxia persists long enough gangrenous changes take place. This is reached in only a few cases. The affected part becomes dry, black and cold, and superficial gangrenous blebs appear. A line of demarkation shows itself; and the dead part sloughs away much less extensively, than the appearance would indicate. The attacks are generally very painful. Haemoglobinuria may be present. The gangrene is usually superficial, and rarely causes an extended loss of substance.

Pathology.—This is obscure. Raynaud suggested that it is due to arteriole spasms. It is supposed that some changes take place in the vaso-motor centers, of the medulla and cord. The disease rarely proves fatal.

Treatment.—It seems very probable that thorough treatment of the spinal column, in the region of the vaso-motor centers supplying the parts affected, would be quite effective in controlling the disease. Follow this treatment by a systematic manipulation of the entire limb. The patient should be kept warm, and well protected from the cold. Wrap the parts in wool and keep them slightly elevated.

SECTION XI.

DISEASES OF THE MUSCLES.

THOMPSEN'S DISEASE.

Synonym.—Myotonia congenita.

Definition.—An hereditary affection, characterized by tonic spasms of the muscles; induced by voluntary movements.

Etiology.—The disease is congenital and in family groups. The men are more frequently affected than the women. Isolated cases presenting the same features have been described but they are rare. The disease is rare in this country and in England, but quite common in Scandinavia, Germany, France and Italy.

Morbid Anatomy.—There is an increase in the muscular fasciculi, and a multiplication of the nuclei of the muscles. The heart is not affected; but the diaphragm may be involved. The spinal cord and the nerves are not affected.

Symptoms.—The disease appears in early childhood. The first symptom noticed is a stiffness during voluntary movements. Voluntary contraction takes place slowly, and the relaxation which follows is also slow. This is more marked after periods of inactivity. Upon a repetition of the movements the rigidity wears away. In walking the start is difficult, but after a few steps have been taken the patient can walk without difficulty. The condition is aggravated by emotion and cold. The muscles of the arms and legs are most frequently affected, rarely the facial, ocular and laryngeal muscles. The sensation and the reflexes are normal.

Erb has described a peculiar reaction of muscles and nerves, to the electrical currents called; the myotonic reaction. The contractions attain the maximum slowly, and relax slowly, and vermicular wave-like contractions pass from the cathode to the anode.

Treatment.—It has always been thought by the medical practitioners that this disease was incurable. Muscular

gymnastics, massage and friction, and avoidance of cold or emotional disturbances, chiefly, constitutes their treatment.

Dr. Doneghy, of Wheeling, W. Va., reports the cure of a case of myotonia congenita in 1898 that had consulted some of the most eminent physicians of this country, to no avail. In a personal letter from Dr. Doneghy he refers to the treatment of the case as follows: "I found the lesions in the sixth, eleventh and twelfth dorsal vertebrae, and first, second, third and fifth lumbar vertebrae. While correcting these lesions I gave rectal treatment to stimulate the sympathetic plexuses, in front of the sacrum, to restore sexual power, as he had lost all erectile power and nocturnal emissions occurred from one to three times per week. He had been thus afflicted for about four years. The patient has been well for the last ten months, i. e., ever since I discharged him, cured."

The osteopathic treatment of diseases of muscles; is usually a local one. Disturbances of nutrition to the muscles, is caused by locally deranged tissues. Treatment of the muscles itself by manipulation is always indicated.

SECTION XII.

HEAT EXHAUSTION; THERMIC FEVER.

Synonyms.—Heat exhaustion; insolation; thermic fever; heat prostration; heat stroke; heat fever.

Definition.—An affection produced by exposure to excessive heat. Two varieties are recognized; thermic fever and heat exhaustion.

Heat Exhaustion.—This is caused by prolonged exposure to high temperatures, combined with physical exertion. This may occur without exposure to the direct rays of the sun, the heat being artificial or in midsummer in close confined rooms, the same result will be produced. There is vaso-motor paralysis, the surface of the body is usually cool, the temperature may be as low as 95 degrees F., while the pulse is small and rapid.

Sunstroke or Thermic Fever.—This is usually caused by prolonged work under the direct rays of the sun in a humid, very hot and sultry atmosphere. This is caused by the action of the heat upon the heart centers producing a paralysis of those centers.

Morbid Anatomy.—The rigor mortis develops early and is marked. Putrefactive changes appear early. The various organs are deeply congested, the venous engorgement is extreme in the cerebrum. There is rigid contraction of the left ventricle; while the right is dilated and filled with blood. The blood is fluid and dark. Parenchymatous changes take place in the liver and kidneys.

In heat exhaustion with lowered temperature there is a paralysis of the vaso-motor center in the medulla, and the heat is dissipated more rapidly than it is produced. In thermic fever the heat regulating centers become paralyzed; by the action of the excessive temperature and more heat is produced, and less dissipated than normal.

Symptoms.—*Heat Exhaustion.*—This may occur gradually or suddenly with a severe attack of faintness, pallor, dizziness, headache, cold perspiration and sometimes blind-

ness as the first symptom. Consciousness is rarely entirely lost. In severe cases there is more permanent collapse. The pulse is rapid and feeble and there is great restlessness and delirium. Under prompt treatment mild cases may recover in a few hours, while in extreme cases death may occur almost at once from heart failure.

Thermic Fever.—In some cases the patient is struck down, becomes quickly unconscious, and may die within an hour, or death may be almost instantaneous. In other cases there is pain in the head, oppression, dizziness, nausea, vomiting and sometimes diarrhoea or frequent micturition. Soon unconsciousness sets in, the face is flushed, the eyes injected, the breathing labored and there is a temperature from 106 to 112 F. The pulse is full and rapid, the skin hot and dry and the pupils are contracted. There is usually complete relaxation of the muscles, but in some cases there is twitching and jactitation. Epileptiform convulsions are rare. In fatal cases the coma deepens, the pulse becomes feeble, rapid and irregular, the breathing becomes hurried and shallow and death occurs in a few hours. Favorable cases are indicated by a fall in the temperature and by the return of consciousness. In these cases recovery may be complete. In either case the patient may never be able to stand even moderate degrees of temperature, which often produce excitement, headache and pain in the cervical region. Failure of the memory, and the loss of power to concentrate the mind are sometimes a sequelae. Meningitis, epilepsy and insanity are also sequelae.

Diagnosis.—This presents little difficulty. The history and circumstances preceding the attack are very important in making the diagnosis. The diagnosis between heat exhaustion and thermic fever is readily made. In heat exhaustion the temperature is lowered, the pulse is feeble, consciousness is rarely or completely lost; in thermic fever the

temperature is extremely high, there is usually complete unconsciousness, and the pulse is full and rapid.

Prognosis.—This should be guarded, depending upon the severity of the case.

Treatment.—In *sunstroke*, place the patient in a recumbent position and loosen all constricted clothing, and stimulate the heart's action. The high fever is to be met promptly. Place the patient in a bath of water, to which add ice freely. The patient may also be rubbed with ice, and ice water enemata may be employed. The muscles of the neck will be found contracted, probably due to cerebral hyperaemia. A thorough relaxation of these muscles will be of great aid in equalizing the vascular system. It is a good plan to thoroughly relax all the muscles along the spinal column for the same purpose. When the temperature nears normal the baths should be stopped. After the temperature has been reduced place the patient upon a cot with ice to the head. The cervical treatment should be repeated as often as necessary. The diet of the patient should be liquid for a few days. The sequelae are to be treated according to the condition.

In cases of *heat exhaustion* remove the patient to a shady place and apply water to the face, chest and spine. Thoroughly treat the upper cervical region, aiming to control the impaired vaso motor centers and nerves. If the temperature is below normal a hot bath should be given. Keep the heart and lungs stimulated.

SECTION XIII.

DISEASES DUE TO ANIMAL PARASITES.

INTESTINAL PARASITES.

TAPE WORMS.

Varieties.—Taenia solium; taenia saginata; taenia flavopunctata; bothriocephalus latus.

Etiology.—The larvae of tape worms are introduced into the intestinal canal by food and drink. The parasite reaches adult growth in the intestines. The larval forms are then found again in the muscles and solid organs.

Taenia Solium.—Is derived from the hog, and is the most common form in this country. When mature it is from two to four yards in length. The head is small, about the size of a pin, and provided with four cup-like suckers surrounded by a double row of hooklets, hence it is called the armed tape-worm. The head is fastened to the body by a thread-like neck, and following the neck, the body occurs in segments. The sexual organs, both male and female, occur in the center of the broad surface of the segment. The segments are about one millimeter in length and seven or eight millimeters in breadth. There are thousands of ova in each mature segment. The worm attains its growth in about twelve to fifteen weeks, after which time the segments are shed and passed. For further development the ova must gain entrance to the stomach of a pig or of a man, and passing from the stomach they may reach the muscles and organs and develop into larvae or cysticersi.

Taenia Saginata.—This is derived from beef, and is much longer and larger than the taenia solium. It is from five to six yards in length; the head is over two millimeters in breadth, is square shaped, and has four large sucking discs, without hooklets; hence it is called the unarmed tape-worm, in contradistinction to the hooked variety. The segments are thicker and the ova larger, and they are passed and ingested in the same manner as in the taenia solium.

Taenia Flavo-punctata.—This is a small tape worm not exceeding twelve to fifteen inches in length. It is common in rats. The larvae are developed in lepidoptera and beetles.

Bothriocephalus Latus.—This is found especially in Europe and is very long, measuring from eight to ten yards; it is derived from fish, is not provided with hooklets, but has two lateral grooves. The segments are short and wide, the sexual organs being on the narrow side of the segment.

Etiology.—Unhealthy condition of the stomach and intestines is the predisposing, and uncleanliness an important, factor in the occurrence of tape-worm. Those eating imperfectly cooked beef or pork, or other meats and fish, and those handling fresh meats, are liable to be affected with tape-worm.

When the ovum is taken into the stomach the capsule is dissolved off and the embryo passes into the small intestines, fastening itself into the mucous membrane, by its hooklets and suckers, and grooves.

Symptoms.—Tape-worms occur in the human being at all ages. Oftentimes symptoms are absent, the expulsion of segments being noticed and thus the worms accidentally discovered. The tape-worm is seldom dangerous, but if a worm is known to exist it is always a source of considerable anxiety on the part of the patient.

There are dyspeptic symptoms, colicky pains, nausea and occasionally diarrhoea. The appetite is variable, sometimes ravenous. This condition is followed by loss of flesh, and various reflex phenomena as vertigo, headache, convulsions, palpitation, choreic movements, itching of the nose and anus, paralysis and rarely insanity. In addition to these symptoms there may be a wrinkled countenance, sensation of a cold stream winding itself toward the back immediately after a meal, pain in various parts of the body and ringing

in the ears. The decisive diagnostic symptom is to find segments of the worm in the stools.

Diagnosis.—Discovery of the ova or segments in the passages of the bowels is the only proof of the presence of a tape-worm.

Prognosis.—Favorable in all cases.

Treatment.—Prophylactic treatment is necessary. Meats should be thoroughly cooked so that the larvae will be destroyed; and all segments of tape-worms passed in the stools should be burned—by no means should they be thrown outside or in the water-closet.

The immediate expulsion of a tape-worm is not a necessity. First of all the mode of living, and then the general state of health should be corrected. Tapeworms invariably result in a general state of unhealthiness; and with improved health and corrected digestive processes the worms cannot exist, and in a short time will be expelled. Expulsion of the head is necessary before the case will be cured, for if the head is not expelled new segments will continue to grow.

Stimulating the liver to increase the amount of bile, and increasing the activity of the digestive glands of the stomach and intestines, by a thorough treatment of the splanchnic region and direct treatment over the abdomen, will be quite sufficient for the cure of intestinal parasites. The treatment will probably have to be repeated several times, in order that the intestines may regain a healthy tone, so that the parasite will not find favorable conditions for its existence within the intestines, and that the bile may be secreted in sufficient quantities to dislodge the worm.

Hahneman claimed, "that during a period of comparative health tape-worms do not inhabit the intestines proper, but rather the remnants of food and fecal matter contained in the intestines, living quietly as in a world of their own with-

out the least inconvenience to the patient and finding their sustenance in the contents of the bowels. During this state they do not come in contact with intestinal walls, and remain harmless. But when from any cause a person is attacked by an acute disease the contents of the bowels become offensive to the parasite, which in its writhing and distress touches and irritates the sensitive intestinal lining, thus increasing the complaints of the patient considerably by a peculiar kind of cramp-like colic. (In similar manner the human foetus in the womb becomes restless, twists its body and moves whenever the mother is sick, but floats quietly in the liquor amnii, without distressing her while she is well.)" This but harmonizes with the osteopathic theory and practice with regard to tape-worm; that there is an unhealthy condition of the intestines which predisposes to the affection, and the cure must be a consequent correction of such a disordered state.

During the treatment, if a light diet of milk and broths is given, it will favor an earlier removal of the parasite, by helping to remove the mucus in which the head is embedded.

NEMATODES, OR THREAD-WORMS.

Ascaris Lumbricoids (*Round Worm*).

This is the most common parasite, and is found principally in children; it is also found in cattle and hogs. It is of a yellowish brown color and in form resembles earth worms. The worm is cylindrical, pointed at both ends; the female is from seven to twelve inches in length, and the male from four to eight inches. They are probably introduced into the stomach by food and drink. They occupy the upper part of the small intestine, and are usually one or two in number, though they may be numerous. Occasionally they migrate into the stomach and are ejected by

vomiting, or into the trachea and produce suffocation, or into the larynx or Eustachian tube, or they may pass downward to the anus, or into the bile ducts.

Symptoms.—Oftentimes symptoms are absent. There may be dyspepsia, colicky pains, mucous stools, meteorismus, vertigo, fretfulness, voracious appetite, anaemia, sallow complexion, headache, chorea and convulsions. Other symptoms may be present, as grinding of the teeth and itching of the nose and anus. Obstruction of the bowels has occurred. If a worm enters the bile duct obstructive jaundice occurs. A decisive diagnosis can be given only when the worm is seen.

Treatment.—Particular attention should be paid the liver, for it is here that we must seek the natural remedy in the form of bile, in order to eject and cleanse the system from nematodes.

Modes of improper living should be corrected; cleanliness is essential, and there should be attention to the general health of the patient. Thorough correction of all defects of the spinal column in the region of the splanchnics, and careful direct treatment of the bowels is indicated.

OXYURIS VERMICULARIS.

(*Thread-worm; Pin-worm.*)

This small parasite, commonly seen in children, is from three to five millimeters long in the male and about twenty millimeters in the female, is blunt at one end and sharp at the other, and occupies the colon and rectum. They are probably introduced into the intestines in the ova, by uncooked fruits and vegetables, or by the dirty hands of mothers and nurses to the infant. They vary greatly in number, migrate to the rectum where they deposit their eggs, and are often discharged in the faeces, where they appear like pieces of ordinary white thread.

Symptoms.—Loss of appetite, anaemia, restlessness and irritability are marked. The itching becomes intolerable and painful, when the worms come down in the rectum to the anus and within the folds about the anal orifice. In the female the worms may wander into the vagina where they become particularly distressing, and thus may produce excessive sexual excitement and cause nymphomania and masturbation.

Treatment.—Cleanliness of the most scrupulous kind should be demanded in every instance. Injections of cold water and applications of lard about the anus and within the rectum will destroy the eggs as soon as they are deposited, besides relieving the terrible itching.

Attention to the general health of the patient and great care of the intestines and other digestive organs is absolutely necessary. The spinal treatment to the intestines and other digestive organs, as well as thorough direct treatment over the abdomen, is indicated.

TRICHINIASIS.

Synonym.—Trichinosis.

Trichiniasis is a name given to a disease produced by the embryos of the trichina spiralis. In the adult condition the trichina spiralis lives in the small intestines. The embryos migrate into the muscles where they finally become encapsulated. Man is infected by eating insufficiently cooked pork containing the encapsulated worm, which is set free during the digestive process. About the third day they attain their full growth and become sexually mature. Each one discharges large numbers of embryos. As soon as born the young brood is carried away from the bowel and invade the muscles through various channels—principally by means of the blood stream and along the connective-tissue routes. The female trichina may bring forth several

broods of embryos in succession. In nine or ten days after infection the first brood reaches its destination. They attain to maturity in about two weeks after entering the muscular tissue. In this process an interstitial myositis is excited and a fibrous capsule is formed in from four to six weeks. The capsule gradually becomes thicker and finally calcareous infiltration may take place.

Thorough cooking destroys the parasite. The disease is most frequent among the Germans who eat raw ham and sausages.

Symptoms.—These are sometimes absent especially when only a few are eaten. If large numbers have been ingested, gastro-intestinal symptoms develop in the course of a few days. Vomiting, diarrhoea, and pain in the abdomen may be present.

In from one to two weeks muscular symptoms develop. There is fever, muscular pain, especially during motion, and the muscles are stiff, tense and sometimes swollen. When the respiratory muscles are involved dyspnoea is produced which may prove fatal. Oedema, especially of the face, is an important symptom. Profuse sweats, itching and tingling of the skin have been observed.

Diagnosis.—Epidemics of this disease are more easily diagnosed than an isolated case. Among the Germans, if cases of apparent typhoid fever occur after a picnic or other feasting occasion, where raw ham or sausages have been indulged in, this disease should be suspected. Examination of the stools and of the muscles will be of aid. The worms may be discovered in the pork, a portion of which has been eaten by the patient.

Prognosis.—This depends upon the number of worms ingested. The prognosis should always be guarded. Early, marked diarrhoea is favorable.

Treatment.—Prophylactic treatment is of great importance in trichiniasis. An inspection of the meat supply as is carried out in Germany should be employed by this government; although the most practical way to prevent the disease is to thoroughly cook all pork and sausages. The central portions of the meat should be well cooked.

In the feeding of hogs care should be taken that they do not receive any offal, but only milk, grain, vegetables, etc.

When a person is infected with trichiniasis, thorough and prompt evacuation of the bowels should be performed at once, so that the embryo young will not have time to pass into the muscles, but will be ejected from the body. This should be followed by a thorough and persistent treatment for several days of the liver and intestines; treat both the liver and intestines directly and through the spine. The object of this treatment is to render all the digestive juices active, so that they may dislodge the animal parasite and to prevent their passing into the muscles. Also keep the bowels active for several days.

When the larval parasites have entered the muscles, a treatment cannot be applied to affect them directly, but the health of the body should be maintained if possible, and the severer symptoms, as the muscular pains, weakness and insomnia combated. Thorough manipulation, massage and hot baths will be of special aid in relieving the stiffness and weakness of the muscles.

SECTION XIV.

HAEMORRHAGES.

NASAL HAEMORRHAGE.

Synonyms.—Nose bleed; epistaxis; rhinorrhagia.

Etiology.—Traumatism, such as, picking the nose, blows, and surgical operations; straining when coughing; nasal tumors and ulcerations; lesions of the atlas, or any lesion of the upper cervical vertebrae, that would interfere with the vaso-motor distribution to the nose and cause local congestion or weakness of the blood vessels; obstructions to the general circulation; irregularities or suppression of the menstrual flow may result in nose-bleed, as a vicarious menstruation; suppression of a habitual haemorrhoidal discharge.

Pathology.—The great frequency of nasal haemorrhage is due to the great vascularity of the nasal mucous membrane. Usually in cases of spontaneous origin, bleeding is from the region of the septal artery. Spontaneous bleeding may also occur from posterior hypertrophies or adenoid vegetations. The blood flowing downward into the fauces, is expectorated in such cases, and may be mistaken for a haemorrhage from the lungs.

Treatment.—The position of the individual is important. He should assume a sitting posture or as near one as possible. Holding the nostrils tightly, or plugging them with a piece of cotton, will favor the formation and retention of a clot, so that the haemorrhage may be controlled. Pressure upon the carotid artery, or upon the facial artery at the angle of the inferior maxillary, will slow the blood current and favor the formation of a clot. Correcting any lesions that may exist in the superior cervical region, as derangement of the vertebrae or contracted muscles, will remove obstructions or irritations to the vaso-motor system of the affected region, and thus equalize the vascular system. Holding the arms above the head, and the application of ice to the nose is of aid in some cases. Also, the injection of cold or hot

water into the nostrils. In serious and obstinate cases where other methods fail, a plugging of the anterior and posterior nares should be resorted to, using absorbent cotton or gauze.

BRONCHO-PULMONARY HAEMORRHAGE.

Synonym.—Hemoptysis.

Etiology.—Pulmonary congestion; croupous pneumonia; tuberculosis; haemorrhagic infarction; ulcers of the larynx, trachea or bronchi; gangrene of the lung; fibrinous bronchitis; carcinoma of the lung; lesions of the vertebrae or ribs, from the second to the seventh dorsal inclusive, may cause diseases of the bronchial tubes or lungs, that result in hemoptysis, or the haemorrhage may be caused directly, by extreme congestion resulting from the disordered vaso-motor nerves; diseases of the heart, such as mitral disease, causing pulmonary congestion; aneurism of the branches of the pulmonary artery; vicarious hemoptysis from deranged menstrual functions; diseases of the vessel walls, or blood, as scurvy, anaemia, hemophilia, etc.

Pathology.—In many cases the lesions are microscopic, consisting of ruptured capillaries. In other cases larger vessels may be ruptured, or are the seat of erosion. Many other lesions may be observed. After death the bronchial mucosa is occasionally found inflamed and the lung tissues paler than normal.

Diagnosis.—A differential diagnosis must be made between epistaxis, hemoptysis and haematemesis.

In *epistaxis* the blood may flow from the posterior nares into the pharynx; it causes coughing and a discharge of the blood may occur the same as in haemoptysis. A careful examination of the nasal region alone can determine the source of the bleeding.

In *haemoptysis* the history of the case as to pulmonary or

cardiac diseases is to be considered. There is a feeling of weight and of uneasiness in the chest. A salty taste and a tickling of the throat precedes the bleeding. The blood is ejected by coughing and is bright red, frothy, very little coagula, and is alkaline in reaction.

In *hematemesis* the history would indicate disease of the stomach, spleen, liver or heart. Uneasiness, and occasionally nausea and faintness, precedes the bleeding. The blood is ejected by vomiting, and is dark, clotted or fluid, mixed with food, and is of acid reaction. In a few instances the blood due to hemoptysis may be swallowed, and vomited.

Treatment.—In all cases of hemoptysis the patient should be placed in bed and absolute rest demanded. An attempt should at once be made to correct any lesion that may be found influencing the cause of the bleeding. Correcting lesions to the vaso-motor nerves of the lungs and bronchial tubes, and equalizing the disturbed vascular area, may be quite sufficient in a number of cases. These lesions will be found principally in the upper dorsal region. In some cases, perhaps, there is an impairment of the trophic nerves by the same lesions, thus interfering with the tone of the vessel-walls and pulmonary tissues. The diet should be light, nutritious and non-stimulating. The use of hot drinks is to be avoided. The rapidity of the heart's action should be reduced. This is best performed by thorough treatment of the dorsal spinal nerves, of the left side over the heart, and by inhibition in the sub-occipital region. The ice-bag to the precordia is also helpful. Iced drinks and the eating of ice is of aid. Stimulation of the systemic circulation will be of value in helping to relieve the pulmonary congestion; although the two systems are somewhat independent of each other. Also, hot foot baths and the evacuation of the bowels may be of additional value. In cases due to organic disease of the heart, the mind and body should receive ab-

solute rest, so that the diseased areas may be strengthened as much as possible; besides a tonic treatment for the heart's action is necessary.

After the haemorrhage has subsided care should be taken that bleeding does not occur again. All irritations of the respiratory tract should be avoided. A stimulating diet, tobacco and alcohol should be avoided. Nutritious food and a moderate amount of exercise is indicated.

HAEMORRHAGE OF THE STOMACH.

Synonym.—Hematemesis.

Etiology.—Injuries to the stomach; local diseases as congestion, ulcers and cancer; vicarious menstruation; a mechanical obstruction to the portal circulation; spinal lesions to the vaso-motor nerves of the stomach; alterations in the blood; perforation of the stomach walls, and involving a blood vessel, from disease of some neighboring organ.

Diagnosis.—A careful examination of the case and the blood ejected will be necessary to determine the nature of the cause. The differential diagnosis as to the source of the blood, whether from the stomach or lungs, was given under hemoptysis.

Treatment.—Correcting of any lesion that may influence the blood pressure, in the region of the stomach, is the first requisite. Treatment of the splanchnics has the greatest influence upon the vaso-motor nerves to the stomach. Treatment of the vagi nerves and of the fourth and fifth dorsals, will quiet the violent movements of the stomach, and thus aid in controlling the haemorrhage. Stimulation of the cervical sympathetics and heat to the feet will tend to equalize the vascular system, and thus lessen the gastric congestion. The application of a broad flat ice-bag over the stomach will be of great value.

INTESTINAL HAEMORRHAGE.

Etiology.—An obstructed circulation of blood through the vena-porta, as in diseases of the heart, lungs and liver; lesions of the vertebrae deranging spinal nerves to the intestinal blood supply; injuries caused by corroding or cutting substances; mechanical injuries to the intestines; degeneration or erosions of the blood vessels, from ulcers of the intestines, as from typhoid fever, typhus, dysentery, etc.; disordered menstrual or haemorrhoidal discharges.

Diagnosis.—The locality of the intestines affected can be approximately determined, by an examination of the discharged blood. When the blood comes from the upper part of the intestines, it is generally dark and mixed with the intestinal contents, which gives it a tarry appearance. It is generally red and fluid when it comes from the lower portion of the bowels. If from the stomach, the blood is thoroughly mixed with fecal matter. Throwing the passage into water, the water is colored red when it contains blood; and if the contents contain bile the water is colored green or yellow. Also, noting the areas of contracted muscles, as in intestinal colic, will aid in the regional diagnosis.

Treatment.—Absolute rest in all cases is necessary, the patient remaining as quite as possible. Food, in severe cases, should not be given for ten or twelve hours. The bed-pan should be used in caring for the evacuations. Correction of the lesions along the spinal region, chiefly of the lower dorsal and lumbar regions, that are impeding the innervation to the intestines should be attended to at once. This treatment relieves any hyperaemic condition of the intestinal mucosa and influences the whole vaso-motor area of the mesentery. Direct treatment of the abdomen in some cases is of great value to relieve obstructed and contracted vessels in the mesehtery. Treatment along the spinal col-

umn from the sixth dorsal to the coccyx is helpful in all cases to quiet the peristalsis of the intestines. In severe cases cold drinks, eating of ice and an ice pack to the abdomen is of aid.

HEMATURIA.

Etiology.—Congestion and acute inflammation of the kidneys, acute exacerbations of pyelitis, renal calculi, chronic nephritis, traumatism, tuberculosis, etc.; affections of the urinary tract as calculi or lacerations of the ureter; calculi, cystitis ulcerations, etc., of the bladder; calculi, gonorrhoea, parasites, etc., of the uretha; general diseases, chiefly the acute specific fevers and blood diseases; blows, wounds and traumatic influences, external to the kidneys; lesions of the renal splanchnics.

Diagnosis of the locality of the haemorrhage in the urinary tract: In haemorrhage from the *kidney* the blood is thoroughly mixed with the urine, giving a uniform color. Blood casts and leucocytes are present. In haemorrhage from the *ureters* the blood is usually molded in clots and conform to the shape of the ureter. The clots appear like small dark worms. In haemorrhage from the *bladder* the blood is not thoroughly mixed with the urine and large clots form upon standing. In haemorrhage from the *urethra* the blood often discharges without micturition. When urine is passed the blood precedes the passage of urine.

Treatment.—Rest is essential. A correction of the lesions to the renal splanchnics is necessary to control the congestion and inflammation of the kidneys. When the ureters, bladder or urethra is involved, attention must be given to the condition of the spinal column below the renal splanchnics. In all cases an inhibitory treatment to the lower spine column and ice to the loins is of value.

UTERINE HAEMORRHAGE.

Most of the causes of uterine haemorrhage come under the subject of obstetrics; others under mennorrhagia and metrorrhagia. Such will be found in obstetrical and gynecological works.

Treatment.—The patient should assume the dorsal position with the buttocks raised. If any displacement of the uterus is present and if there is any foreign material in the uterus, usually such, should be corrected and removed at once. Stimulation of the clitoris is a most effectual means to control uterine haemorrhage; it contracts the circular fibres of the uterus. Stimulation of the uterus directly through the vagina, and over the abdomen, and stimulation of the upper wall of the vagina, will aid in contracting the uterus. Correction of obstructions of the vaso-motor nerves of the uterus through the splanchnic and lumbar region is important. Compression of the abdominal aorta and vaginal injections of warm water may be of aid. In severe cases inversion of the body if it can be done with safety may be performed. Packing of the vagina is a method resorted to occasionally in severe cases.

SECTION XV.

HAEMORRHOIDS AND VARICOSE VEINS.

HAEMORRHOIDS.

Synonym.—Piles.

Definition.—A dilated or varicose condition of the plexus of veins lying in th sub-mucous tissue of the lower part of the rectum. The dilatation of these hemorrhoidal veins may extend into the adjoining sub-cutaneous tissues and mucous membrane, and the peri-rectal plexus and adjoining venous plexuses of the bladder, uterus, vagina and sacral canal may become involved.

Morbid Anatomy.—Haemorrhoids are divided into two classes, external and internal. An external pile is one that arises from the margin of the anus outside of the external sphincter muscle. It differs from the internal pile from the fact that it is always composed either of skin or hypertrophied connective tissue, forming a mere cutaneous tag, or else it is composed of a small cutaneous vein enlarged by a clot of blood. The internal haemorrhoids are composed mostly of enlarged veins and are connected by hypertrophied connective tissue. They have a free arterial supply and are covered by the mucous membrane of the rectum. They are due usually to an affection of the middle haemorrhoidal blood supply, thereby being a part of the visceral vascular system. Internal haemorrhoids when protruding can be returned within the rectum, while the external ones cannot. The venous turgescence varies in size from a pea to a walnut. They may be single, or may surround the entire anal opening like a bunch of grapes.

Repeated attacks of engorgement of the veins involved, will in time change the mucous membrane or the sub-mucous tissue, and cause catarrhal swelling of the mucous membrane, or hyperplasia of the connective tissue. At first the haemorrhoid is usually a blood tumor but in chronic cases they are oftentimes made up largely of connective tis-

sue. Owing to pressure of the varicose veins, atrophy of the mucous and sub-mucous tissue may occur. The white or slimy haemorrhoids occur, when these roughened parts of the mucous membrane become inflamed and thickened, resulting in suppuration.

Etiology.—The chief predisposing cause of piles is man's erect position and the absence of valves in the haemorrhoidal veins. Thus a retardation or stagnation of the portal vein would cause a backward movement of the entire column. It is evident that such a downward pressure of the blood in the portal system would dilate and extend the blood vessels to the very capillaries in the rectal region.

This retardation may arise from several causes; obstruction of the portal vein from diseases of the liver, diseases of the heart, obstruction or destruction of the capillaries of the lungs, pressure from a gravid uterus, tumor, etc., a general loss of tonicity of the abdominal walls, as in persons who take but little exercise, the excessive use of wine, tea and coffee, injuries to the spinal column, especially in the lumbar, sacral and coccygeal regions, a dislocation of an innominate bone, lifting, constipation, straining at stool, carelessness of the calls of nature, etc. Catarrh of the bowels may cause a congestion of the mucous membrane and consequently piles. Hereditary influence may be a potent factor in a few cases.

Symptoms.—The symptoms are quite diagnostic and need not be mistaken. Besides the appearance of tumors, there may be constipation, pain during stools, indigestion, headache and pain in the back. Haemorrhages frequently occur, and if suddenly checked, as by cold, other disturbances occur as congestion of the head, lungs, stomach, liver, kidneys, etc., which may result in haemorrhages from those organs. Fissures of the anus, contraction of the rectal sphincters and prolapsus of the rectum may occur. Occasionally

in old people there is a varicose state of the veins of the neck of the bladder, and in females of the uterus and vagina, which causes haemorrhages of these organs. The communicating plexus of the spinal canal may be affected causing weight, numbness and pain so as to simulate a lesion of the cord. The patient may have a hypochondrical disposition and be disinclined to work especially at mental labor.

Prognosis.—Depends upon its predisposing and immediate causes; but a large majority of cases can be cured. Osteopathy can handle successfully at least ninety per cent of cases.

Treatment.—A thorough examination of the patient should be made, not only to ascertain the extent of the local trouble, but to understand thoroughly the general health of the sufferer, especially the state of the heart, lungs and liver.

Many cases of haemorrhoids are caused by lesions in the lumbar and sacral regions, and especially dislocations of the coccyx (usually anterior) and the innominata. Correcting these lesions will oftentimes cure the haemorrhoidal disorder. Dislocations of the coccyx in the majority of cases can be cured by external manipulation. Others require the introduction of the first finger into the rectum so as to get a firm grasp of the coccyx. Simple dilatation of the rectum once a week, in addition to other treatment, is of great aid in curing haemorrhoids, not a few of the cases being cured by dilatation alone. It relaxes the tissues about the tumefied vessels. Treatment is rarely necessary above the second lumbar, unless there is more or less of a constitutional disorder, as the superior haemorrhoidal blood vessel of the inferior mesenteric is given off about opposite the second lumbar.

In cases where the abdominal walls have become relaxed, a treatment should be given to strengthen the abdominal muscles and viscera. Treatment should be given over the

abdominal muscles directly, and also to the spinal nerves of the same region. The diet should be strictly regulated and the bowels kept loose; and stimulants, indigestible food, full meals and too much meat should be avoided. Injection of cold water before stools is a good prophylactic, and applications of cold water to the protruding pile will be of some help in relieving the congestion. Surgical operations are seldom necessary.

VARICOSE VEINS.

In varicose veins there is a dilatation of the calibre of the veins and their valves are insufficient. The walls are irregularly thin, lengthened and tortuous.

Etiology.—The internal saphenous is the vein most frequently affected, although any vein throughout the body may become varicosed. Commonly, varicose veins occur in the lower extremities and occasionally in the arms.

The valvular insufficiency is caused by stretching of the wall of the vein, thus separating the thin, free edges and leaving an interspace that allows regurgitation of the blood. The valves becoming insufficient, the column of blood in the veins has no support against gravity, and being interrupted in its course does not flow normally into collateral channels. The walls of the veins become thin, as does also the adjacent skin, thus increasing the danger of a rupture, either external or subcutaneous.

Varicose veins are most frequently found in females, following uterine enlargements. The condition may be due to any obstruction or constriction that prevents the free return of blood from the veins, such as dislocations of the hip, either slight or complete, dislocations of innominata, tissue constrictions about the saphenous opening, garters, and in fact anything that might impede the free venous flow. The tendency to varicose veins increases as age advances, and many

cases are found among people of middle life who have been accustomed to standing a great deal. Injuries of the pelvis, thigh or leg lessening the nutrition to the leg, or injuries to the nerves, as vertebral dislocations in the lower dorsal or lumbar regions affecting the limbs, may be causes of varicose veins. Pregnancy or tumors in the abdomen or pelvis, causing pressure upon the iliac veins are occasionally causes. Distention of the sigmoid flexure, causing pressure upon the left iliac vein, or distention of the caecum, pressing upon the right iliac vein, are fruitful sources. Also might be stated diseases of the heart and lungs.

Varicose veins of the upper extremities are due to occupations requiring overuse of the arms.

Complications.—Varicocele, haemorrhoids, labial varix in the female, varix over pubes, ulceration and eczema due to disturbances of nutrition, oedema, thrombus and valgus.

Symptoms.—Lower Extremities—Crampy pains in the limbs upon rising. Fullness and heaviness of the limbs. Inspection may reveal superficial varicose veins near the saphenous opening, upon the external thigh, in the popliteal space, upon the external leg or behind the ankles. Oedema and congestion of the foot and ankle occurs in a few cases. Pain is quite a prominent symptom due to pressure upon the nerve fibres. Eczema and itching are due to disturbed innervation to the skin. Ulceration may occur due to the bursting of a vein.

Symptoms of the Upper Extremities.—Before the varicosity appears there is usually pain or a feeling of sprain in the infected region of the arm. The pain is usually confined to a muscle or group of muscles.

Treatment.—The majority of cases are due to disorders about the pelvis, hip or thigh, and the treatment resolves itself into the removal of these obstructions or constrictions. Frequently cases are caused by partial dislocations

of the hip joint, which can be easily overlooked during a hurried examination. The slipping of an innominate is an important factor and also one easily overlooked. Quiet rest in a recumbent position, attention to the general health, and especial attention to the bowels and liver, are essential in acute attacks. Occasionally the heart and lungs are at fault.

In all cases thorough treatment to the affected limb should be given, also treatment to the spinal innervation of the limb, which aids in restoring tonicity of the varicose vessels, chiefly through the vaso-motor nerves to the lumbar region.

In rupture of varicose veins the haemorrhage can be arrested by elevating the limb, and applying pressure with the fingers above and below the wound, until a compress and bandage can be applied. The support of the varicose veins by elastic stockings will ease the pain and prevent oedema in many cases, but as a rule it is a direct hindrance to the circulation on account of the necessity of having the stocking fit closely. Surgical operations are rarely indicated.

VARICOCELE.

A varicose enlargement of the veins of the spermatic cord, epididymis and testicle. In varicocele the pampiniform plexus is usually enlarged, but all the veins of the cord may be involved. There is a knotty swelling giving a feeling when examined by the fingers like a convolution of earth worms. The swelling gets smaller under compression or in a horizontal position and enlarges again on standing erect. It is almost invariably found on the left side; and the testicle on the affected side is generally smaller and softer than its fellow.

The *predisposing causes* are a longer and tortuous spermatic vein on the left side; the absence of support of the veins

from surrounding muscles; the imperfect valves; the entry of the left spermatic vein into the renal vein at a right angle, instead of at an acute angle like the right vein; the more liability of compression of the left spermatic vein by accumulation of faeces in the sigmoid flexure; the lack of normal exercise of the sexual functions in young, unmarried adults.

The exciting causes are straining during stool, heavy lifting, excessive sexual indulgence or anything that would determine more blood to the testicles. Varicocele is similar to the varicose state of the haemorrhoidal veins and may have like causes.

The diagnosis is easily made. The feeling of the veins between the fingers like a convolution of earth worms, dull, aching, dragging sensation, and possibly prostration, weakness and dejectedness of spirits are characteristic symptoms.

The *treatment* consists of a regulation of the bowels, removal of such predisposing and exciting causes as may be found; and treatment of the vessels along the spermatic cord, and treatment to the lower dorsal and lumbar regions. Surgical interference may be necessary in some cases in order to effect a cure.

TREATMENT OF THE MALE GENITAL ORGANS.

The osteopathic treatment of various weaknesses and disorders of the generative organs of the male, is given principally, through the lower dorsal and upper lumbar regions. In this part of the spinal cord the center that controls the genital organs is located. Various lesions may occur in the spinal column, chiefly lateral and posterior derangements. Also in some cases the lower ribs becoming deranged interfere with the innervation to these organs; and occasionally, treatments through the lumbar and sacral regions will prove effective. Treatment to the prostate gland directly,

to the sympathetic nerves about the trigone of the bladder, to the nerve fibres passing along the spermatic cord, to the arteries directly, through the abdomen, and to the pelvic bones when deranged, are all important points of consideration in disorders of these organs.

SECTION XVI.

DEFORMITIES.

PATHOLOGICAL SPINAL CURVATURES.

SPINAL CURVATURES.

Any deviation of two or more consecutive vertebrae from the normal curves of the spinal column, is usually termed by the osteopath, a pathological curvature. Of the common pathological curvatures of the spinal column there are found, (1) scoliosis or lateral curvature, (2) kyphosos, or excurvation, antero-posterior curve with the convexity backward, and, (3) lordosis, or incurvation, antero-posterior curve with the convexity forward.

Etiology.—Of primary importance in the causation of pathological curvatures of the spinal column, are injuries to the spine, such as strains, falls, blows and various physical forces, acting directly, or indirectly, as injuries to the chest, pelvis and limbs. The osteopathic physician in his daily work finds more curvatures, as well as acute and chronic diseases resulting from some simple injury to the spine, as a slip, strain or twist, than from any other cause. The dire effects of any violence to the spinal column can not be overestimated.

Among predisposing causes may be mentioned, continued ill health, general weakness, rapid growth, rachitis, tuberculosis, etc. Any habitual one-sided position may result in a curvature. An injury to the chest, adhesions from pleuritis, chronic liver disease, obliquity of the pelvis, producing unequal length of the legs, carrying heavy weights on one side, and various morbid growths of the chest and abdomen, may all produce curvatures. Many cases are found in school children who are growing rapidly, and whose muscular strength and development, do not keep pace with their growth. Unilateral atrophy of the muscles, due to central changes, and unilateral hypertrophy from central changes or over-use, may be the cause of the inflammation of the

spinal column in severe cases. Sacro-iliac disease in some instances is a potent factor. Thus there may be a great variety of causes producing the initial period, and the spine being favored at a single point and in a certain way gradually develops a curvature.

Scoliosis.—This is the most common spinal deformity and is characterized by lateral deviation from the median line. In most cases the curve is to the right in the upper dorsal region, with a compensatory curve in the opposite direction in the lumbar region. The curve being to the right, in the majority of cases, is probably due to the fact, that most people are right-handed.

Morbid Anatomy.—The vertebrae in the region involved are rotated so that their spinous processes point toward the concavity of the lateral curve. The bodies of the vertebrae on the side next to the concavity are thinner, due to absorption; the intervertebral discs are made thin on the same side by pressure and absorption. The ribs are considerably distorted, depressed on the concave side and prominent on the convex side. The ligaments on the concave side are contracted, and stretched on the convex side. The muscles on the concave side are more or less contracted, and on the convex side they are stretched, causing atrophy and fatty degeneration of their tissues.

Kyphosis.—This may be a slight posterior curve really amounting to nothing, or it may be a very grave pathological condition, as in Pott's disease. Therefore it is very necessary that one should make a most careful diagnosis (see Pott's disease).

The most common causes of kyphosis are, Pott's disease, rachitis, occupation, general weakness, rheumatism and old age.

In Pott's disease, the posterior curve is characterized by a sharp angle, and by the spine being very rigid. This taken

in conjunction with the history and other symptoms should be sufficient to enable one to make a diagnosis.

The condition of round shoulders, which in time produces marked kyphosis, is rarely a habit as it is usually termed. In nearly every case it indicates, either a weakness of the back muscles, or what is more apt to be the cause, a strained condition of a dorsal vertebra, commonly of the lower dorsal region.

Morbid Anatomy.—In mild cases there is simply a relaxation of the ligaments of the vertebrae and a separation of the laminae and spinous processes. In severe forms there may be absorption of the anterior portion of the intervertebral discs and the bodies of the vertebrae (Pott's disease).

Lordosis.—This may be a congenital condition, especially when occurring in the lumbar region. Anterior curves of the spine are generally found in the lumbar or cervical regions, but occasionally occur in the dorsal region, causing the spinal column to be more or less straight, and thus weakening the individual. This curve is commonly compensatory to kyphosis, hip-joint disease and congenital dislocations of the hip.

Treatment of Spinal Curvatures.—The treatment of pathological curves of the spinal column, by osteopathic means, has been highly satisfactory to both physician and patient. The success of the osteopath in these cases has been due to his comprehensive and exact knowledge of each vertebra, and of the spinal column in general. He recognizes curvatures that the ordinary practitioner, and I believe I may safely say, the orthopoedic specialist, would not even notice or recognize. On account of the highly developed sense of touch of the osteopath, he is capable of recognizing the slightest deviation of one vertebra from another, and of the spine in general, from the normal. Thus by the uniqueness and peculiarity of his work he is capable, not only of

discovering a curvature, but also of reducing a curve already found.

The work consists of, first, relaxing any muscles that may have become rigid over the seat of the curve. Then follows a treatment to each vertebra involved, by attempting to replace it, and treatment to the curve in general by springing it toward its normal position. At each treatment effort should be made to accomplish something toward correcting the spine; too many treatments are given in a "general" way, and being unspecialized amount to nothing. One must become familiar with the exact location of each vertebra involved, to attempt a correction of a curvature intelligently. Upon this one point I can not speak too strongly, for a great many treatments have been wasted, and improvement of cases retarded, by not paying enough attention to the details of the diagnosis, either from pure slothfulness, or from an imperfect conception of osteopathy.

Lateral curvature in the dorsal region is undoubtedly the hardest to correct on account of the ribs, which complicate the condition. A marked curve in the dorsal region is sure to be accompanied by a dislocation of the vertebral end of one or more ribs.

The dislocation of an innominate sometimes complicates matters, but is a simple point to remedy, and should not be overlooked.

The correction of a curvature presents a special study to the physician, whether it be scoliosis, kyphosis or lordosis, and special rules cannot be laid down for treatment. Cases of rare occurrence are what might be termed "symmetrical" curves; i. e., no vertebra presents separately a marked lesion, the column on the whole being simply bowed. Such cases can be treated by springing back the spinal column, and the use of methodical exercises. Unfortunately most cases are

characterized by various lesions between the vertebrae, and thus each lesion requires special work.

For simple curves the use of braces, jackets and various mechanical appliances are of very little use to the osteopath, in fact more harmful on the whole, than useful. Naturally they would apply to a "symmetrical" curve, or where the patient is too weak to sit or to walk, but they can be of very little use to the average patient, in comparison with correct osteopathic treatment. Mechanical appliances confine the movements of the patient, interfere with the development of the muscles and impinge to a greater or less extent upon the spinal nerves. Due attention to hygienic surroundings and diet are certainly of aid. Proper exercises and work for the sufferer should be advised.

POTT'S DISEASE.

An article on Pott's disease does not really come within the province of a practice of medicine, still I think it will be acceptable to the practitioners and students of osteopathy, as one of the objects of osteopathic work is to improve, not only medical and obstetrical practice, but, also, surgical practice, and besides the osteopath will have many cases of spondylitis to treat. I will not enter into a description of the symptoms and morbid conditions of Pott's disease, for they can be readily obtained from various surgical works, but suffice it to give the osteopathic ideas of such cases.

The first consideration in the treatment of Pott's disease is rest. If the disease is a progressive one rest in bed in the recumbent position is necessary. Naturally, the object of the treatment is to secure resolution of the tubercular ostitis as soon as possible. To do this careful manipulative treatment should be applied to the diseased vertebrae. The treatment must not be harsh, for there would be danger of

greater irritation to the parts, and possibly infected particles from the destroyed tissue might gain entrance to the vascular system. The osteopath must be extremely careful how he manipulates the spinal column in Pott's disease. The object of the manipulation is not primarily to overcome the deformity, as some may think such an act possible, but to separate the vertebrae enough to allow a freedom of the circulation, and to remove impingements of the nerve tissue. It is impossible to overcome the deformity to any extent when part of the body of the vertebra has become destroyed; but if one could treat the case at the start most probably deformity would be prevented. There is another danger in treating cases too severely, and that is causing exhaustion of the patient. Treat the spinal column not only to separate each vertebra slightly, but to carefully crowd the diseased vertebrae toward their normal position. When the disease is in the dorsal region considerable attention has to be paid to the ribs, as they are invariably involved, when the spinal curvature is great. Hence it is necessary to treat each rib separately and try to correct them, at least, to relieve any obstruction to nerve fibres or vessels that may be found. One of the strongest arguments against the use of braces, jackets and various mechanical appliances in spinal deformities, is that they tend to straighten the spine, by simply crowding the vertebrae and ribs as a whole into place, besides interfering with the cutaneous circulation. The osteopath realizes that each vertebra and rib has to receive special treatment, in order to correct the spinal column, and that mechanically exerting pressure upon all the vertebrae at one time tends to lock the vertebrae and ribs all the more securely. It is like trying to correct a certain subdislocation of the cervical vertebrae, by pulling and twisting the neck, instead of applying specific treatment, the lesion is all the more firmly fastened.

After the tissue destruction has been limited, and the deformity corrected as much as possible, an ankylosis should be secured if possible. To promote ankylosis depends altogether upon the preceding treatment—rest and an improved nutrition of the parts. The treatment of spinal abscesses are entirely in accordance with surgical treatment.

In all cases the general health of the patient has to be well taken care of. The physician must not be over-zealous for a quick cure. It takes many months to perform a cure, however, there is always a tendency toward a cure. Treatment of the spinal muscles and of the limbs, and pure air, sunlight, massage and good food are very necessary.

HIP-JOINT DISEASE.

Possibly osteopathy has won more laurels correcting disorders of the hip than from any one class of diseases. These disorders, though, have not been tubercular diseases of the hip joint; they have been partial and complete dislocations of the hip, without tubercular complications. The osteopath has been able many times to locate the cause of various symptoms, throughout the leg, especially the knee, from a partially dislocated hip. Even bow-legs may be caused, by the nutrition to the inner side of the leg being partly obstructed by deranged tissues about the hip, and thus one side of the leg receives more nourishment than the other side. In partial dislocations of the hip, the femur is usually found upward and backward in the acetabulum.

Little can be given outside of surgical treatment of hip-joint disease. Rest is very essential in these cases. Manipulation of the limb should be most carefully performed, although manipulation will aid very greatly in the healing of the diseased parts, even when abscesses have occurred. Additional treatment of importance, is treatment of the spinal nerves to the affected area, and deep treatment over the iliac

vessels. Otherwise, the treatment of the abscesses and the diseased parts are entirely in accordance with surgical treatment.

TYPHOID SPINE.

A "typhoid spine" comes as a sequel to typhoid fever. There is contant pain, tenderness along the lumbar region and rise of temperature. The pain is generally increased when the spine is moved forward or sidewise. Such a condition is clearly understood by the osteopathic physician. There is always found distinct vertebral lesions along the region that is tender on pressure. In fact these very lesions may have been the real cause of the attack of typhoid fever. The treatment is rest and the indicated manipulation to correct the derangements.

SECTION XVII.

OSTEOPATHIC GYNECOLOGY AND OBSTETRICS.

OSTEOPATHIC GYNECOLOGY.

It was my intentions at first to confine the present work to the diseases commonly treated in practices of medicine, but there being many requests during the preparation of the work, that I include some osteopathic ideas along gynecological work, I have concluded to do so, hoping that the few hints I may give will be of some practical benefit to the osteopathic physician. It is impossible on account of limited space to deal with morbid states, symptoms, surgical work, etc., in this article; such can be readily obtained from many elaborate works on gynecology, suffice it to give practical osteopathic points in the examination and treatment of diseases of women.

Examination.—The osteopath finds that most of the diseases of the female pelvic organs (excluding lacerations, wounds, etc.), are due to anatomical derangements of the vertebrae below the eighth dorsal, and to subdislocations of the pelvic bones. Occasionally a lesion along the region of the fourth and fifth dorsal may affect the uterus reflexly.

When the uterus is involved, a slight posterior or lateral curvature of the lumbar region, is a very common cause of the disturbance. This lesion is especially found when the uterus is congested or inflamed, on account of involvement of vaso-motor nerves to the uterus. In dysmenorrhoea and amenorrhoea a posterior curve of the lumbar region is the common cause. Other lesions may be found as irregularities of the lumbar vertebrae, or lower dorsal vertebrae, or of the pelvic bones. Occasionally in inflammatory diseases of the uterus, and in dysmenorrhoea and amenorrhoea, the floating ribs are found displaced downward. Dr. Still says these displaced ribs draw the diaphragm downward, and this constricts the vessels passing through it, which consequently favors a lack of blood or a

retardation of blood in the pelvis. A displaced floating rib may also obstruct the nerves from the spinal cord, and thus interfere directly with the uterus. Other lesions that may be found when the uterus is diseased, are the displacements of the pelvis which have been given under osteopathic diagnosis; these displacements may be an anterior or posterior subdislocation of the innominata, or a rotary lesion, or a tipping of the pelvis as a whole.

The ovaries may be affected by a lesion at the eighth and ninth dorsals, or slightly lower. Also, lesions of the eleventh and twelfth ribs, and of the innominatum on the side diseased, may cause serious disturbances in the ovary. Occasionally a lesion may be found at the fourth and fifth lumbar vertebrae.

Diseases of the Fallopian tubes may be caused by lesions of the floating ribs, lower dorsal and upper lumbar vertebrae, and by a deranged innominatum.

It must be remembered that all the pelvic organs are subject to extension of disease from one to the other, and to inflammation from adjacent organs; also from various diseases and injuries. I am simply giving exclusive osteopathic anatomical derangements, which are found, to the nerves and blood vessels.

The local examination of the organs, external and internal, is of the same nature as described in various gynecological text books.

Treatment.—The primary treatment of the pelvic organs is generally to correct disorders of the lumbar and dorsal vertebrae and of the pelvic bones. Local internal treatments are only given when it is necessary to correct displacements of the uterus, and to give a tonic treatment to the vaginal walls and uterus. The treatment of the vertebrae and pelvic bones is the same as given under osteopathic regional treatment. Treatment of the lumbar region has a marked

affect in controlling the blood vessels of the pelvic organs, especially the uterus by way of the vaso-motor nerves. Care should always be taken as to the condition of the innominata. A displaced innominatum may affect the spinal nerves to the uterus, tubes and ovaries, or the disturbance at the symphisis pubes may affect the nerves at that point (clitoris) to the uterus, especially the nerves to the circular fibres of the uterus.

Treatment over the abdomen has some effect in raising the uterus, by working upon the broad ligaments. Also, the work over the abdomen tones up the abdominal walls, and affects all muscular tissues of the organs beneath, besides strengthening the peritoneum (suspensory ligament of the uterus), and helping to overcome any prolapsus of the uterus that may be due to the prolapsed condition of the abdominal organs.

Local treatment of the uterus is a necessary treatment when the occasion demands. Rarely should local treatments be given oftener than once per week or ten days. It usually requires the strengthening effects of the spinal treatment before a local treatment is of much account. The local treatment is best given when the patient is in the Sim's position. It consists practically, first, after introducing one or two fingers into the vagina, of a sweeping upward movement, including one-half of the wall of the vagina in the one movement, to smooth out the folds of the vagina, thus stimulating the local nerves and raising the tissues about the uterus, and the uterus if it is prolapsed; then reversing the movement of the hand and giving an unward sweeping movement to the other side of the vagina. This is to be given a few times until the walls are smoothed and all contracted fibres relaxed, and the uterus raised if it is prolapsed. The second part of the treatment is to correct displacements anterior, posterior or lateral of the uterus; this treatment is

entirely in accordance with treatments given in works on gynecology. Manipulation and relaxation of tissues may be given to stimulate the local nerves. Tampons are to be used if the uterus is badly prolapsed and will not remain in normal position after being replaced. Adhesions may be broken up after careful continued manipulation, requiring usually a course of treatment of several months. When there are lacerations, polypoid growths, tumors, etc., manipulation will be of no use whatever as far as a cure is concerned; but treatments through the spinal region and local treatment, will often relieve the congestion and inflammation to a great extent, and thus be of great aid to the surgeon.

Before giving a local treatment it is best to thoroughly relax and inhibit the muscles at the fourth and fifth lumbar; this tends to relax the tissues about the uterus and aids one in correcting a displacement. Thorough inhibition at the second, third and fourth sacral foramina relaxes the sphincter vagina and vaginal tissues. After a local treatment is given, if the patient is nervous, it is a good plan to inhibit along the spine at the fourth and fifth lumbar, and also at the suboccipital; this relieves the nervous strain of the patient.

In cases of dysmenorrhoea strong inhibitory treatment in the lumbar region, especially at the fifth lumbar is effective, in connection with the treatment of the lesions found. In cases where cramps and pain precede the menstrual flow and as soon as the flow is established the pain ceases, an inhibitory treatment over the clitoris will usually give instant relief. The inhibitory treatment over the clitoris relaxes the circular fibres of the uterus. In a few cases of painful menstruation the uterus may be found displaced.

In amenorrhoea strong stimulation of the lumbar region with the correction of any lesion that may be found is usu-

ally sufficient. Additional treatment may be given over the blood vessels to the iliac region and the pelvic organs; and the floating ribs should be raised. Hot baths, also, have some effect in re-establishing a flow. The cause should be determined if possible before any treatment is given. A patient may be so weak that menstruation is not possible. The case should be thoroughly studied.

When the ovaries are diseased treatment over and about the ovaries has but little effect. The vertebrae along the eighth, ninth, tenth and eleventh dorsals are usually involved and treatment to correct these lesions, and inhibition at the tender points found should be given; also, the floating ribs should be carefully examined. The innominata may also be affected as well as the sacral nerves. The treatment to the Fallopian tubes is practically the same. A local treatment to replace a displaced uterus may be necessary in ovarian colic. In fact the uterus being displaced may cause many symptoms, especially reflex symptoms, as nausea, vomiting, headache, palpitation of the heart, etc. In many diseases of the uterus douches and antiseptic methods are of use. The osteopath never hesitates to use such if they are indicated. Also, general treatments, attention to diet and hygienic rules, is a necessary part of osteopathic treatment in all classes of disease.

In treating the vertebrae of the lumbar region, I usually have the patient on the side, and by flexing the thigh on the abdomen, I make use of the legs as levers as given under osteopathic regional treatment. When treating over the sacral foramina have the patient upon the face, for then a most effectual and thorough treatment can be given over the sacrum. Watch most closely for lesions between the fifth lumbar and sacrum. Tapping quite strongly over the sacrum has considerable effect in cases suffering from de-

layed menstruation, in establishing the flow. To treat the broad ligaments place the patient upon the side, and reach from behind the patient over upon the lower broad ligament and raise it upward and inward; then place the patient upon the other side and give the same treatment to the other broad ligament. Treatment over the round ligaments directly, stimulates these ligaments and tends to shorten them when they become stretched, besides it has some effect upon the uterine tissues. The pudic nerve may be treated to advantage, instead of the spinal treatment, at the point near the spine of the ischium. For the treatment of haemorrhages from the uterus, see the article on haemorrhages.

Nerves of the Uterus.—The nerves of the uterus, according to Landois and Quain, chiefly are: *Sensory.*—(a) In contraction, tenth, eleventh and twelfth dorsals and first lumbar. (b) Os uteri (first) second, third, fourth sacral (fifth lumbar very rarely). At these points the osteopath inhibits and relieves various pains in the region of the uterus.

The *motor* nerves are principally from the sacral nerves. These fibres pass, chiefly, directly to the pelvic plexus and then pass with the blood vessels to the broad ligament along side of the uterus, and some accompany the branches of the uterine artery, but most of them pass directly into the substance of the uterus, principally, along its neck and lower portion of the body. In the broad ligaments they connect with the ovarian nerve. The ganglia at the neck of the uterus can be reached by local treatment. It has been found that stimulation of the hypogastric plexus, causes contraction of the uterus; these fibres arise from the last dorsal and upper four lumbar, run into the sympathetic, and then reach the hypogastric plexus.

The uterus may be contracted reflexly on stimulation of the sciatic center, the central end of the brachial plexus, and the nipple. Stimulation of the nipple; has been employed quite successfully in diseases of the uterus, by Dr. Bolles, of Denver. In referring to the manipulations of the nipple, for the reflex effect upon the uterus and appendages, Dr. Bolles says: "It seems to be indicated, especially in such cases as sub-involution from lack of the natural stimulus of the nursing function, as in miscarriages, abortions, weakness or inanition of the child, or even of the mother, such as to make nursing unadvisable, etc. It is most effective at the time this function should naturally be performed. Any foreign matter in the uterus is especially apt to cause response in the prompt expulsion of the irritant, if the reflex arc referred to is intact. This makes it applicable to retained secundines, so common in cases of not nursing after parturition, also to expulsion of a dead foetus." For the original article see the report of the meeting of the A. A. A. O. for 1898.

Probably the work along the upper dorsal, and specially at the fourth and fifth dorsal; is occasionally an aid reflexly to the uterus, by way of the brachial center and the splanchnics.

The vaso-motor fibres are from the splanchnics to the hypo-gastric plexus. Treatment of the lower dorsal and lumbar region; is very effectual in controlling disturbances of the vaso-motor nerves to the uterus. The vaso-dilators pass through the nervi erigentes.

Inhibition of the clitoris, causes the circular fibres of the uterus to relax. The treatment is a practical one, and is used a great deal in osteopathic obstetrics and gynecological work. It is claimed that inhibition of the clitoris contracts the ovarian artery. When an innominatum is partially dislocated, it is apt to obstruct, or irritate nerve fibres

at the symphisis pubes. The parturition center is at the second lumbar.

I hope from these few fragmentary statements; some one may find an idea that will aid them practically. It is impossible owing to space to go into an elaborate article on gynecology, as it would require several hundred pages to do it justice. The foregoing points, practically include the essential differing osteopathic gynecological work; from other gynecological work. It must be borne in mind, however, the osteopath employs all useful methods; of various systems, coupled with this, and that the preceding only, can be the pith of the osteopathic work.

OSTEOPATHIC OBSTETRICS.

Much has been said, and claimed by osteopathic physicians; in regard to being able, by osteopathic work, to shorten and render labor comparatively painless. These claims are true to a large extent, but of course there is nothing mystical along the line of osteopathic obstetrics; any more than in osteopathic work elsewhere, it is all plain, common sense. The osteopath always works in harmony with nature, along common sense lines. Labor, at the best, is certain to be more or less painful, but in saying this, I do not mean to convey the idea that there is not much in osteopathic obstetrics. There certainly is a great deal to be accomplished, in lessening pain and hastening labor.

The osteopathic features are few, simple and directly to the point, above all very effective.

The essential points are:

(1) To hasten labor, a stimulating treatment should be given at the second and third lumbar region, as in this region the parturition center is reached. This treatment brings on labor pains and it should be given when the

patient is on her side, and when the labor pains come on the patient can be turned on her back again.

(2) To aid in the dilatation of the os uteri; inhibition of the clitoris and round ligaments is given. Also, inhibition at the eighth and dorsal dilates the os. This treatment has a marked effect upon the circular fibres of the uterus. The treatment should be lightly given over the clitoris, barely more than the weight of the hand, with the finger resting on either side of the clitoris.

(3) When the pains are severe they can be checked by inhibition at the seventh and eighth dorsal, at the eleventh and twelfth dorsal, and at the fourth and fifth lumbar, but principally at the seventh and eighth dorsal, and the fourth and fifth lumbars. This treatment does not interfere with the progress of the case whatever, and it does relieve the patient greatly. The inhibition probably obstructs the sensory nerve influence to the brain.

(4) In removing the placenta, and in stopping haemorrhages, stimulation to the clitoris has a marked effect, as it favors expulsion of the placenta, and it controls the circular fibres of the uterus and stops bleeding. Stimulation of the parturition center, is also an aid in removing the placenta. An inhibition over the clitoris, aids in relieving bearing down symptoms.

The preceding are the salient points in osteopathic obstetrics. They are the real differing features from other methods of treatment, and by their use labor is lessened, remarkably, in regard to time and pain. It must be remembered, that the osteopath employs the usual methods given in text books on obstetrics.

For control of uterine haemorrhages see article on haemorrhages. The osteopath has found that in a number of cases of milk leg, the hip is partially dislocated, which has occurred during labor; on account of the position of the

leg. In relieving "morning sickness," outside of the usual methods employed by dieting, etc., the osteopathic physician, is many times able to relieve the sickness, by thorough treatment to the fourth and fifth dorsal. Also slight dilatation of the external os; if carefully given may relieve the sufferer.

When the mammae are sore and tender (excluding external influences) a thorough raising and spreading of the third, fourth and fifth ribs is usually sufficient to relieve the trouble. Also, carefully treat the cervical region. The lesion generally found, when the breasts are diseased; is the dislocation of one of these ribs, especially the third or fourth.

SECTION XVIII.

TREATMENT OF THE RECTUM AND COCCYX.

To treat the rectum intelligently and thoroughly, requires special work on the part of the osteopath. A speculum should be used when making an examination, and all abnormal conditions carefully examined with the eye; although considerable can usually be noted, by the examination with the finger. The best position in which to give an examination and treatment; is to have the patient on the side, with thighs flexed upon the abdomen. In a few cases the patient may lean over the end of an operating table; this position is used, especially when the coccyx is hard to correct.

The object of rectal treatments are many—to relieve haemrorrhoids, papillae, etc., of the mucous membrane, to correct a dislocated coccyx, to treat an enlarged prostate gland, to relieve a prolapsed rectum, to tone the lower bowel in cases of constipation, to give reflex stimuli to the heart and lungs, in cases of fainting, paroxysms, etc., to aid in correcting a displaced uterus, to relieve severe pains in the rectum at the time of the menstrual period, and to relieve congestion, inflammation, contracted tissues, etc., of local sources. It can be seen at once, that attention to the rectum, is an extremely important part of osteopathic work, and also to the surgeon, in the many cases that require surgical interference. The osteopath does not advocate treatment to the rectum, as often as the orificial surgeon, but he does fully appreciate many irritations and diseases, that are dependent upon a disordered rectal state. Neither does he hesitate to apply surgical work, if he thinks it is necessary.

The principal object of osteopathic internal rectal treatment, is three-fold: (1) to relax all contracted and constricted fibres about the walls of the rectum and between the sacrum and coccyx. (2) To correct a dislocated coccyx. (3) To dilate the sphincters thoroughly; in order to relieve

irritations about the sphincters, and to stimulate the sympathetic nerve.

In some instances rectal treatments are given: To treat an enlarged prostate gland, to correct a displaced uterus, and to make a more thorough examination of the uterine tissues, the Fallopian tubes and the ovaries.

In giving local treatment cleanse the fingers, and oil the index finger, then after introducing it into the rectum, relax the contracted tissues, by an upward sweeping motion on all sides. This treatment relieves all obstructions to vessels and nerves; caused by contracted fibres, and tones the rectal nerves.

To correct a dislocated coccyx, after introducing the index finger into the rectum, place it between the articulation of the coccyx and sacrum, and then with the finger, anterior to the coccyx, and the thumb posterior, one has complete control of the coccyx. Whether it is anterior, posterior or lateral, the treatment is essentially the same; produce moderate traction on the coccyx, enough to release it from its articular attachment, and then push or pull it, toward its normal position. It may require several treatments to correct the coccyx. These treatments are usually given a week or ten days apart. Never take hold of the coccyx, and try to force it into position, until it has been first released from its articular attachment. One may readily injure the coccyx, if they are not careful. Oftentimes considerable can be done, in correcting a coccyx without internal treatment, by careful manipulation of the muscles and the coccyx externally, when the patients are on their side.

To dilate and stretch the sphincters thoroughly a speculum or dilator should be used, still considerable can be done by one or two fingers. The sphincter should be thoroughly stretched in all directions, care being taken when an instru-

ment is used that too much force is not applied. This treatment is of aid in cases of haemorrhoids and prolapsus of the rectum, in constipation due to the loss of tonicity of the lower bowels, in tightness of the sphincters, in pain of the rectum, and in stimulating the heart and the lungs. In cases of a prolapsed rectum, due to irritation about the sphincters, causing tenesmus, this treatment is of special value, as it gives the sphincter a physiological rest.

The prostate gland may be treated very effectively, by local treatment through the rectum. A local treatment to the gland, is usually indicated when it is enlarged. The treatment consists of careful relaxation of the tissues; on either side of the gland. This influences the nerves and blood vessels to and from the glands. Care should be taken not to bruise the gland. The nerves of the prostate pass between the gland and the levator ani. The secretory nerves to the prostate gland are from the sacral nerves. The sensory nerves to the gland, according to Quain, are from the tenth, eleventh (twelfth) dorsal and first, second, and third sacral, and fifth lumbar. Lesions affecting the prostate gland are occasionally found at the tenth and eleventh dorsal, and at the fifth lumbar. Treatment and correction of these points are necessary, when the prostate is affected. The nerves to the bladder, and to the male genital organs may be reached by treatment to the trigone.

According to Quain, the sensory nerves to the rectum; are from the second, third and fourth sacrals. Some of the motor fibres of the circular muscles of the rectum are from the lower dorsal, and upper two lumbar nerves; these pass by the aortic plexus to the inferior mesenteric ganglion. Associated with these fibres, are the inhibitory fibres of the longitudinal muscles of the rectum. The sacral nerves contain motor fibres to the longitudinal muscles, and inhibitory fibres to the circular muscles of the rectum. In all cases

of rectal trouble, the lower dorsal and upper lumbar vertebrae may be found deranged, and thus interfere with the rectal nerves. Relaxation of the sacral muscles over the sacral foramina, has a marked effect in relieving tenesmus. In dysentery, where there is a constant desire to defecate, a thorough upward relaxation of the sacral muscles will give great relief.

SECTION XIX.

TREATMENT OF THE EYE AND EAR.

TREATMENT OF THE EYE.

A great many cases of various diseases of the eye; have been very successfully treated osteopathically. I might state, that if there is any one line of diseases that have been treated more successfully than any other, by osteopathic treatment, it is diseases of the eye.

Anatomical derangements affecting the eye may be found anywhere from the sixth dorsal, including the ribs, to the occipital bone. The majority of lesions in cases of eye diseases are located in the upper and middle cervical vertebrae; although serious eye diseases may occur, and the cause be found entirely in the upper dorsal region. These lesions, are the same as derangements, elsewhere in the body. Most of them occur in the vertebrae and ribs, although many may be found in the deep muscles.

In diseases of the anterior part of the eyeball, lesions are generally found, in the upper cervical region (atlas, axis and third cervical). These diseases include such as the various forms of conjunctivitis, keratitis, etc., in fact any disturbance of the tissues supplied by the fifth nerve. When the fifth nerve is involved; it is almost invariably caused by a subdislocated atlas or axis. Other lesions to the fifth nerve may result from disturbances of the third cervical vertebra, subdislocations of the inferior maxillary, and contracted deep muscles of the upper cervical region. The treatment given in these cases, besides correcting displacements of the upper cervical tissues, is springing the inferior maxillary open; so as to release contracted tissues about its articulation, stimulating treatment to the facial points of the fifth nerve, and if necessary, as in cases of granulated eyelids, a thorough local treatment of the eyelids; after carefully cleansing and oiling the fingers; place a finger and thumb on either side of the eyelid, and lightly massage the

parts; so as to re-establish a normal circulation, to stimulate the local glands and to remove the granulation. In cases of pterygium, the object of the treatment is to correct the vascular supply of the surface of the eyeball, which is principally controlled by the fifth nerve. A light treatment to the growth directly; by the end of the finger,will be a helpful measure. When the tear-duct is found obstructed and not due to organic growths, simply a stricture caused from irritation of motor nerves, the lesion is usually found, in one of the upper three or four cervical vertebrae.

When diseases occur to the inner eyeball, lesions may be located anywhere in the cervical or upper dorsal vertebrae, but especially in the middle cervical region. The pupil may be contracted, by stimulation of the middle cervical region; and it may be dilated, by inhibition at the second or third dorsal. The lymphatics of the axillary and cervical regions have important relations to the eyes;as well as to the various tissues of the cranium. Lesions to the axillary lymphatics occur, principally from dislocations of the ribs in the immediate region, and to the cervical lymphatics, from subdislocations of the middle and inferior cervical vertebrae. It has been suggested, that possibly the mammary gland's internal secretion; is essential to the metabolism of the eye, as extirpation of the breasts weaken the eyes. If such is the case lesions from the third to the sixth ribs, inclusive, will affect the mammary secretions.

Structural changes of the eyeball, as in myopia and hypermetropia, and in cases of astigmatism, may be remedied by osteopathic treatment if such conditions are acquired. The treatment is to re-establish an unimpaired blood supply to the eyeball, so that all parts may be equally nourished. In cases of corneal astigmatism impairment of the fifth nerve is generally found. What is necessary in such cases is an equal distribution of nourishment to all the meridians

of the cornea. When the crystalline lens is impaired, as in cataract, osteopathic treatment may be able to cure the condition in a few cases. The principle of the treatment being to correct an obstructed circulation to the eyeball, due to lesions in the cervical vertebrae, so that the condition may be absorbed.

The muscles of the orbit may become involved by lesions in the cervical region, but especially by lesions in the upper dorsal vertebrae. A few cases of strabismus have been cured by correcting lesions of the upper dorsal vertebrae. I am unable to state the nerve connection in such instances; it is probably through the sympathetic system. Treatment over the eyeball would have some influence in such cases.

Treatment of the optic nerve itself is given principally through the cervical spine. It is claimed by some that a few fibres of the optic nerve arise in the cervical spine. Also, lesions of the cervical spine would influence the circulation to the optic nerve.

Our principal work in all cases of eye diseases is through the superior cervical ganglion to the cavernous ganglion, and then to the fifth nerve or the sympathetics to the eye; also, to the blood supply to the optic nerve and eyeball. In a few instances the vertebral end of the first rib may be displaced and impinge the vertebral vessels. The treatment to the eyes externally is largely a secondary treatment to aid in stimulating the venous blood supply.

TREATMENT OF THE EAR.

In treating diseases of the ear there are two regions that should be carefully examined for lesions. The first is the atlas and axis; in the majority of cases of ear diseases the atlas will be found at fault. The sympathetic, vagus, trifacial, glosso-pharyngeal and occipital nerves may all be involved at this point and affect the ear. The second place

of involvement is the upper dorsal region, as in this region the vaso-motor innervation to the ear is controlled. It should be remembered that the majority of cases of deafness are due to catarrhal diseases.

SECTION XX.

TREATMENT OF SKIN DISEASES.

Various skin diseases have been treated osteopathically with varying success. So much depends upon the cause of the disturbance and its removal in skin diseases, that the cure does not rest so much with the mere treatment, as with the necessary skill in locating the disturbing factor. One has to be continually on their guard to locate external irritations and disorders of the digestive and genito-urinary tracts. A great deal depends upon the avoidance of external influences, nutritious food and an unobstructed circulation. The leading object of osteopathic treatment is to free the circulation and to promote a healthy and unobstructed flow of blood; in no other class of diseases is this more essential than in skin diseases. After the removal of cutaneous irritations and the correction of internal disorders, the cure of the case depends upon the removal of constrictions to the cutaneous blood vessels. The osteopath corrects the lesions found, relaxes the muscles thoroughly and stimulates the circulation to the parts involved, and promotes a healthy activity of all the excretory organs. When the upper part of the body is affected lesions are generally found at the atlas and axis; and when the lower part of the body is affected lesions at the fifth lumbar are of common occurrence; although lesions may be located at various points corresponding with the seat of disturbance. The constant use of hot baths will be found a helpful measure in many skin diseases. The treatment of skin diseases osteopathically is like the treatment of any disturbance, the cause has to be ascertained and treatment applied accordingly.

SECTION XXI.

TREATMENT OF TUMORS.

Many cases of tumors have been treated by osteopathy. A number of satisfactory results have been reported, but on the other hand, quite a few cases have not been helped in the least. The majority of cases of all kinds of tumors treated osteopathically have been benefited. Fibroid tumors of the uterus include the majority of the cases treated. A number of malignant tumors have been treated, but many of these cases were beyond recovery before osteopathic treatment was applied. A few cases of malignant tumors have been reported cured from practitioners in the field.

The cause of tumors is a debated question. Probably there are various causes which are entirely dependent on the tissues irritated or obstructed. Micro-organisms may determine the character of malignant tumors, but in all tumors it seems that osteopathically the nature of the tumor depends upon the vascular channels obstructed. Irritations of embryological tissue may be the predisposing cause of some tumors, and a perverted nerve force of others.

The primary cause of all are derangement to the nerves, blood vessels or lymphatics to the area affected. In cases of tumors of the uterus lesions are found in the lower dorsal and lumbar regions, tumors of the breast (a large number of them have been cured) are the result of lesions to the third, fourth or fifth ribs, and in cases of tumors in other regions, deranged tissues are always found corresponding to the locality affected. A diseased nerve may produce a disturbed nutrition, and an obstructed lymphatic or vein might favor a deposit, and thus an organized growth. All cases have shown vertebral or rib dislocations, corresponding to the nerves and vascular channels of the area diseased.

The treatments have been given with a view of correcting these lesions, so that the various forces and fluids may be re-established to normal, and the growth disorganized and

absorbed. The osteopathic idea, that within the body are all the necessary remedial properties for the prevention, alleviation and cure of diseases, provided that the anatomical is replaced, so that the physiological is free to act, is clearly demonstrated in these cases.

SECTION XXII.

TREATMENT OF MENTAL DISEASES.

The treatment of mental diseases osteopathically has been met with as much success as the treatment of other diseases. This is one point that goes to prove that osteopathic work is not limited to a certain class of ailments; our therapeutics is applied with equal success to all classes of diseases. We have not had as much experience osteopathically with mental disorders as with other diseases, still the work we have accomplished has been most satisfactory.

It is not the purpose of this work to go into any elaborate article on mental diseases. I will give simply the osteopathic experience with this class of disorders. The osteopathic physician, practically, treats insanity as any class of diseases. The principles of osteopathy are applied here exactly in the same manner as elsewhere; if the tissues of the body were anatomically correct, insanity would not occur. We look upon diseases of the mind largely in the same manner as diseases of any organ; that if the nerve and vascular supply to the organ is normal, health must ensue. A mental disease is nothing more or less than the effect of a disturbed innervation or vascular channel to the brain. If we are able to locate the seat of the disturbance to that organ and remove it a cure will result; exactly after the same manner of removing an obstruction or irritation to the stomach or other organs, although frequently diseased tissues are beyond repair, the same as any tissue of any organ may be so diseased, that regeneration is impossible. From the fact that the functions of the brain are comparatively little understood and the brain being the seat of the mind, we are apt to look upon mental diseases in somewhat more of a mystified manner than in disorders of other organs. The brain requires nourishment to repair its tissues, the same as the tissues of any organ of the body, and it is governed by the same laws of nature. Hence there is not the slightest reason why deranged brain tissues

would not interfere with its functions, after the same manner as when other parts of the body are effected by disordered tissues. The osteopath holds to this common sense reasoning in all classes of disorders, and in accordance with this idea he applies his therapeutics and cures result.

The large majority of various mental diseases treated at the A. T. Still Infirmary are cured, although not as a rule as quickly as many other diseases, probably on account of the brain tissues being highly organized, and thus they require more time for repair. The cases treated successfully, represent the various forms of insanity, most of them have been cases of several years' standing, and were confined to asylums before receiving osteopathic treatment. From six to ten months has been the average time required in the cure of these cases, still a number were cured in a few weeks' treatment.

I am unable to give the osteopathic pathology other than what has been given—anatomically deranged tissues, interfering with nerves and vascular channels, to certain areas, or to the brain as a whole. Most of the lesions were located in the cervical region, and consisted of severely dislocated vertebrae, usually of the upper or middle cervical vertebrae. A few cases presented lesions of the dorsal region, especially of the middle dorsal vertebrae, and the vertebrae in the renal splanchnic region and the ribs of the middle right side were usually also affected.

The treatment consisted purely of correcting the lesions found, and paying particular attention to the kidneys and bowels. Naturally, the general health of the patient as to nourishing food given in proper quantity, regular habits and hygienic surroundings was carefully considered. Usually secondary lesions (secondary to cervical lesions) were found, as stated, in the ribs of the right side and in the lower dorsal region. The dislocated ribs would especially

interfere with the portal system, and the dislocated lower dorsal vertebrae with the kidneys.

To the osteopath every disease is manifested externally, and every organ has its reflex nerves that can be affected externally.

SECTION XXIII.

TREATMENT OF VENEREAL DISEASES.

I have not given a description of the venereal diseases because osteopathic experience has been greatly limited in this class of diseases. A few cases of gonorrhoea and of syphilis have been treated osteopathically with success, but I feel that the number of cases treated have been entirely too few to warrant any conclusions. Syphilis runs such a long and varying course, it is impossible to say what the final results would be. A number of cases of gonorrhoea have been treated and were cured in two or three weeks. The inflammation, discharge and pain were easily controlled by a few treatments. The treatment applied, was to the lumbar and sacral nerves, and over the blood vessels in the iliac region in a most thorough manner every day, with a view to control the inflammation; besides, attention was paid to the liver, kidneys and bowels. The treatment in most instances always gave immediate relief.

SECTION XXIV.

VASO-MOTOR AND SENSORY NERVES.

VASO-MOTOR NERVES.

It is extremely important that the osteopathist should be thoroughly conversant with the regions, where he may reach the vaso-motor nerves to various tissues and organs. Many anatomical derangements undoubtedly involve the vaso-motor nerves, and it is therefore necessary to know where they may be affected. The following table is taken largely from the physiology of Landois and Stirling, but many of the statements have been noted at various times; it is, therefore, impossible to give full credit.

The predominating vaso-motor center is in the medulla, consequently, the osteopathic physician gives many cervical treatments to influence this center. Treatment of the upper cervical region has undoubtedly, a marked affect in tending to equalize the vascular system of the body, when it is disturbed.

Head.—The cervical sympathetic for the same side of the face, eye, ear, salivary glands, tongue, etc., and possibly the brain. Lesions are found in all the tissues about the cervical region, but usually in the vertebrae, which influences these nerves. Deep contracted muscles oftentimes involve them. The spinal vaso-constrictors for the vessels of the head are from the first five or six thoracic. It has been surprising many times, to find how many lesions are located in the upper five or six dorsal vertebrae, or corresponding ribs, that have apparently a direct influence upon the vessels of the head. Most probably these lesions are affecting these nerves. Not only congestive headache and congestion of the brain tissues are influenced by lesions in this region, but disease of the eye, ear and face occasionally arise from such derangements. It is always well when the head, neck or even the arms are involved, to examine carefully this region. Vaso-dilator fibres for the face and mouth

are found from the second to the fifth dorsals; these fibres unite almost entirely with the trigeminous, and pass from the superior cervical ganglion of the sympathetic, to the ganglion of Gasser. This fact is of great importance to the osteopath, for oftentimes when inflammation of the face and mouth occurs, lesions may be located along the upper dorsal vertebrae or ribs, or in even the deeply contracted muscles of this region. I have observed in several cases of erysipelas, that the lesion was located in the upper dorsal region; and the cases were cured by correcting these lesions, thus showing that possibly the vaso-motor nerves were the seat of the trouble. Other dilator fibres arise apparently in the trigeminous, for stimulation of this nerve between the brain and Gasser's ganglion causes dilation of the vessels of the face. The lingual and glosso-pharyngeal nerves are the dilators of the lingual vessels. The sympathetic and hypoglossal are the constrictors; these arise in the sympathetic and reach the nerves by way of the superior cervical ganglion. Stimulation of the cervical sympathetic causes constriction of the retinal vessels. This point is extremely interesting to the osteopath, because diseases of the retina and optic nerve, are oftentimes due to dislocated cervical vertebrae, usually the atlas or third cervical. The retinal fibres leave the sympathetic at the superior cervical ganglion and pass along the communicating ramus to the ganglion of Gasser, from whence they reach the eye through the ophthalmic branch of the fifth nerve, the gray root of the ophthalmic, the ganglion and the ciliary nerves. Most all the fibres to the anterior part of the eye are found in the fifth nerve; this, also, is another important point for the osteopath's consideration. Cases of conjunctivitis, keratitis, corneal astigmatism and diseases about the eyelids and tear ducts are usually caused by lesions to the fifth nerve, due to a dislocated atlas or third cervical. The vaso-

dilators for the anterior part of the eye, and also dilating fibres to the iris may be reached at the first and second dorsals. This point is also taken advantage of by the osteopath, for lesions of these fibres occur oftentimes at the upper dorsal. It is claimed that important fibres, that aid in the control of the metabolism of the retina, may be affected at the fourth and fifth dorsals.

Lungs.—Reflex constriction by stimulation of the intercostals, central end of the sciatica, abdominal pneumogastric and abdominal sympathetic. The essential feature to the osteopath, is that the vaso-constrictors to the lungs and bronchial tubes, are very likely to be interfered with by rib and vertebral dislocations, from the second to the seventh dorsals, inclusive, but chiefly at the third, fourth and fifth intercostal nerves. The heaviest innervation being from the third, fourth and fifth spaces, possibly, accounts why asthma is usually due to a dislocation of the third, fourth or fifth rib.

Heart.—Vaso-motor fibres to the coronary arteries are found in the vagi.

Intestines.—Sympathetic, chiefly through the splanchnic nerves. Vaso-constrictors of the jejunum from the fifth dorsal down, for the ileum slightly lower and for the colon still lower. There are none below the second lumbar. Dilators are present in the same sheath, but more abundant in the last three dorsals and the upper two lumbars; all probably end in the solar and renal plexuses.

Liver.—The splanchnics chiefly on the right side. The vagus contains vaso-dilators. There are also fibres from the inferior cervical ganglia of the sympathetic. It might be as well to state here as anywhere, that stimulation of the splanchnics causes dilatation of the receptaculum chyli.

Kidneys.—Vaso-motor nerves from the sixth dorsal to the second lumbar, but principally from the ninth to twelfth

dorsals, inclusive. In the large majority of kidney diseases, lesions are found from the tenth to the twelfth dorsals. Stimulation of the sciatica centers causes contraction. There are also fibres from the superior cervical ganglion.

Spleen.—Vaso-motor fibres are in the splanchnics, principally, on the left side. There are some fibres direct from the brain. Stimulation of the vagi contracts the spleen.

Portal System.—Fifth to ninth dorsal.

Generative Organs.—For Fallopian tubes, uterus, vagina, vas deferens and seminal vesicles, vaso motor fibres are found in the lower dorsal, and the second, third, fourth and fifth lumber nerves, principally.

Coccyx and Immediate Region.—Third lumbar down.

Back Muscles.—Dorsal branches of the lumbar and intercostal nerves. These nerves arise from the gray ramus of the corresponding sympathetic ganglia.

Arm.—From the brachial plexus, the sympathetic, inferior cervical ganglion and first thoracic ganglion, and sometimes lower.

Leg.—Second dorsal down, the sciatic and crural nerves, and the abdominal sympathetics.

SENSORY NERVES.

Inhibition of various regions along the spinal column is frequently given by the osteopath to lessen pain. It is only a temporary or palliative treatment, but many times great relief is given the sufferer. One should inhibit usually over tender points and contracted muscles. These (tender points and contracted muscles) are signs to the osteopath that disturbances exist at these points. The following table is taken from Quain, which is in accordance with a table by Head:

Heart.—First, second and third dorsal.

Lungs.—First, second, third, fourth and fifth dorsal.

Stomach.—Sixth, seventh, eighth and ninth dorsal. Cardiac end from sixth and seventh. Pyloric end from ninth.

Intestines.—(a) Down to upper part of rectum, ninth, tenth, eleventh and twelfth dorsal. (b) Rectum, second, third and fourth sacral.

Liver and Gall-bladder.—Sixth, seventh, eighth, ninth and tenth dorsal.

Kidney and Ureter.—Tenth, eleventh and twelfth dorsal. Upper part of ureter, tenth dorsal. At lower end of ureter, first lumbar tends to appear.

Bladder.—(a) Mucous membrane and neck of bladder; (first) second, third and fourth sacral; (b) over distension and ineffectual contraction, eleventh and twelfth dorsal, and first lumbar.

Prostate.—Tenth, eleventh (twelfth) dorsal. First, second and third sacral, and fifth lumbar.

Epididymis.—Eleventh and twelfth dorsal, and first lumbar.

Testis.—Tenth dorsal.

Ovary.—Tenth dorsal.

Appendages, etc.—Eleventh and twelfth dorsal, first lumbar.

Uterus.—(a) In contraction, tenth, eleventh and twelfth dorsal, and first lumbar. (b) Os uteri; (first) second, third and fourth sacral (fifth lumbar very rarely).

Other points are used by the osteopath to relieve pain of certain regions, for such I refer the reader to the article on neuralgia; besides many tender points are found along the spine by the osteopath, where inhibition gives relief to the patient, provided such points have a connection with the case in question.

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