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EMBODYING THE

OUTLINES OF DIAGNOSIS AND THE CHIEF PATHOLOGICAL DIFFERENCES BETWEEN CHILDREN AND ADULTS

BY

ANGEL MONEY, M.D.LOND., F.R.C.P.LOND.

ASSISTANT PHYSICIAN TO THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND STREET; AND TO UNIVERSITY COLLEGE HOSPITAL; ASSISTANT PROFESSOR OF CLINICAL MEDICINE IN UNIVERSITY COLLEGE, LONDON; PHYSICIAN TO GUARDIAN INSURANCE COMPANY; FELLOW OF UNIVERSITY COLLEGE, LONDON

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TO

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CONSULTING PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL,

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS,

PHYSICIAN TO THE NATIONAL HOSPITAL FOR PARALYSIS AND EPILEPSY,

THIS WORK IS DEDICATED,

AS A TOKEN OF GRATITUDE, ESTEEM, AND ADMIRATION

BY

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# PREFACE TO THE SECOND EDITION.

It has been my endeavour to prepare for the senior student and practitioner a concise but complete manual of the treatment of disease in children. It has been assumed that the reader is already acquainted with a work on general medicine. It was my original intention to have reflected a picture of all contemporary treatment of disease in children. But the material accumulated apace; and a volume of vast dimensions would have been required. Instead I have endeavoured to give what I thought best: to arrange a co-ordinate microcosm for the inco-ordinate chaos. All through the book I have emphasized that treatment I am accustomed to adopt.

The Alpha and Omega of all rational treatment is precise Diagnosis. It is rare that in treatment our indiscretion serveth us better than our judgment. The outlines of Diagnosis are given, but Diagnosis is a matter of practical clinical skill and sagacity hardly to be acquired from books.

It is most difficult to state completely all the pathological differences between children and adults. Without occupying space unduly I have tried to incorporate in this work the chief differences. It will be gathered that a work which is one of Lewis's Practical Series cannot pretend to be of encyclopædic extent. But I confidently hope that the pre-

sent volume will be found to contain, in a handy form, an amount of material of a character which the student or practitioner will find of much value in his everyday professional life. I have not been content with emphatic assertions to the effect that this "must be" and that "should be," but I have also tried to give the why and wherefore, and these wherever possible, in physiological and anatomical terms. In this Edition I have had some of the matter printed in small type, so as not to increase the bulk of the book; this has been, if I may so speak, an invidious task, and I am not sure that some of the text of the small type should not have been better treated, and some of the text of the ordinary type put into small type. My best thanks are due to Dr. Farrar, of Putney, for the preparation of the index.

THE AUTHOR.

Harley Street, Cavendish Square, W.
January, 1890.

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# TREATMENT OF DISEASE IN CHILDREN.

## CHAPTER I.

### INTRODUCTORY.

#### GENERAL TREATMENT OF DISEASE.

In medicine, as in the universe, all things are relative. The dissimilarities between the physiology and pathology of children and adults are differences in degree. Doubtless these differences in degree may be explained as the effect of unfinished growth and development of all parts, but especially of the nervous system, heart, and respiratory apparatus.

Irritability, irregularity and variability are notions never to be absent from the mind in thinking of the treatment and pathology of disease in children.

There is a natural tendency in the mind to erect everything into a standard, type, or test. This is done in treatment and pathology, and diseases are expected to conform to the standard or type. Disease and health and therapeutics in infancy and childhood are very erratic, and refuse, often in a tantalizing way, to be put into the harness of a type or standard. It is the unexpected that happens in infantile physiology, pathology, and treatment. Perhaps this nonconformity of disease and health and therapeutics to a type or test is *the* most striking characteristic of children,

and especially of infants. Dissimilarities between adults and children increase in inverse proportion to age.

In treating disease in infants and children, a care should be had not to harbour false notions of their *kind* of vitality: perfectly astounding powers of repair provided time be given; easiness with which prostration and death may set in; tendency for disease to cause collapse; the inability to maintain for long that state of nerve and circulation which goes by the name of "reaction;" liability of disease to spread, to shift its site and to change the time of its manifestations: these are notions with which to fetter the imagination and to clog the memory. It is the easiest thing in the world to exhaust the energy of an infant by sudden changes in its internal or external environment. Syphilitic babies often get rid of their disease by Nature's own effort; the protoplasm is pitted against the poison. Any aid which we could give should certainly not tend to depress vitality. Let the faith be embraced that many morbid processes have a stronger tendency to go back than to go on; a ball thrown upwards is constantly tending, even in its upward course, to fall again; so it is with most diseases, especially so with those of childhood; what gravity is to the projected ball, Inherited Vitality is to the disease. Let us beware lest we thwart this natural tendency, because the science of therapeutics should be essentially a beneficial interference with natural processes.

The fundamental principles of therapeutics in childhood are those of prevention, hygiene, and expectancy. Measures which tend to lower blood pressure and nervous action, such as depletion, antiphlogistics, sedatives, powerful purging, sweating, and vomiting, must be used sparingly and with considerable caution.

Venæsection, almost impossible in infancy, should as a rule not be practised in childhood, either in convulsions, coma, or inflammation. Leeches may occasionally be used in sthenic

morbid processes occurring in robust children. Leeching should hardly ever be done in the presence of collapse or tendency to syncope. Great care should be taken even in using a few leeches. They should only be used when there is what physiologists call "reaction"—when the skin is hot and suffused, the head burning, the fontanelle full, the fever high, and the nervous centres overacting. Repeated leeching is most injudicious practice.

Mercury and tartar emetic used systematically for acute sthenic diseases will not be found figuring largely in modern physicians' prescriptions.

Opium is a most valuable sedative in childhood, and is freely but discriminately used. Children are very susceptible to its action. It should only be used when absolutely necessary. Under many circumstances bromides and chloral may be substituted, but even these sedatives require caution, for they lower cardiac and nervous activity and depress thermogenesis. Occasionally the subcutaneous injection of morphia may with advantage replace the administration of opium by the mouth.

Blisters must be used with circumspection in childhood, for vesication results more rapidly, ulceration is more prone to follow, and restlessness from irritation is greater in young children. Blistering fluid is safest. The good effects may often be obtained without causing vesication.

To **treat the child** and not the disease applies as much to trivial as to severe illness. I cannot speak too strongly of the importance of managing the cerebral cortex or chief organ of mind in children. Food and medicine must be suited to each child's palate, because every sensation produced by any action on any sensory organ causes an impression on the cerebral cortex as well as on lower centres concerned in the vital processes. If these sensations be of the disagreeable sort, it may be assumed that the

lower as well as the higher cerebral centres are not acting to the best advantage. The best action is assumed to be that which is attended with the most lasting agreeable sensations. These considerations are rendered all the more important when it is considered that the stomach and other abdominal viscera sympathize with the state of the upper parts of the alimentary apparatus. In trivial ailments children are often wayward and wilful, and so the doctor may yield to their mental condition. All medicines should be as palatable as possible, and the dose should be of diminutive proportions—microtherapy not homœopathy.

In severe illness the cerebral cortex or intellect offers less resistance to treatment, but care should be taken that the nervous functions, the heart and respiration do not falter and fail.

Stimulants are most assuredly required in childhood in acute and chronic disease, but they are to be given with discretion, and in as small quantities as possible to effect the purpose in view.

Thirst should be abated by iced drinks or ice wherever possible; as a rule, much drinking is to be avoided; lemonade and orangeade, made with fresh lemons and oranges, may be given in small doses frequently.

Children tolerate well the following drugs:—belladonna, arsenic, strychnia, iron, ipecacuanha, alcohol, and even dilute prussic acid. Active principles, now so easily obtained, are preferable to large doses of crude drugs. Granules or parvules, not homœopathic, of powerful alkaloids and glucosides may be conveniently used in infancy and childhood. The little pellet may be neatly dropped into the region of the deglutition reflex. It is useful to remember that ointments of quinine may be rubbed into the soft skin of the groin or axilla, and also that medicaments may be easily inserted into the rectum.

The healthy or unhealthy existence of any organism is dependent on the concurrence of a certain set of conditions. One is often warned of the baneful influence of drugs in general, and of certain forms of regimen in particular. But there is another aspect to this question. I make bold to say that there exist organisms whose healthy life is promoted, and the term of whose life is extended, by the employment of drugs; in other words, by the introduction of some condition not usually required by the majority of organisms. It is incontestable that some individuals are only maintained in a state of health by the frequent or constant bathing of their nervous tissues with bromide. And the same holds good of certain gouty patients, for whom repeated courses of alkaline treatment bring increased capacity for work and prolonged lease of life. Many women at the grand climacteric period have their lives rendered more happy and more useful, and I even believe extended, by the introduction three times a day into the organism of small doses of alkalies and bitters. If these facts are true, why should some people rail against the use of drugs?

The instruction is pretty general in text books on medicine that the General or Constitutional Health should be attended to. This instruction comprises a great deal. It means that the best measures to promote the healthy performance of every function of the body are to be adopted—not the health of the nervous and muscular apparatus alone, but also that of the digestive, respiratory, circulatory, and excretory systems. Surely a very large order, a very general instruction. The dimensions of the instruction are still further increased when it is remembered that, as a rule, no one of the systems of which the body is composed can be kept healthy unless all the others are also doing their work adequately. Again, the measures to be adopted for the promotion of the health of any system are not always the same in every individual case.

Some measures that act as stimulants in one individual might prove depressants in another. This principle is of special application in children.

Under the heading of Personal Hygiene is included all measures and means designed to promote the health of the neuromuscular apparatus, the digestive organs, and the total excretory system—lungs, liver, bowels, skin, and kidneys. Excretion by the lungs is interfered with in an overcrowded room, for diffusion and escape of gases from the pulmonary blood-surface is impeded.

Muscular exercise in the open air raises blood pressure, dilates cutaneous vessels, and, therefore, promotes cutaneous and renal excretion. Further, the arterial circulation being improved, the abdominal vessels are emptied; there is less tendency to stagnation in the valveless portal system. The action of the abdominal muscles, too, is to force blood through the portal veins into the liver, and on to the heart. The hepatic circulation is almost entirely dependent on inspiration. The respirations are also increased in number and depth, with consequent more efficient discharge of expired air, and increased circulation in the pulmonary vessels.

A definite amount of **sleep** is necessary in order that the nervous energy spent during waking may be restored. Some organisms can perform this ascending metabolism in a shorter space of time than others; but most children require long sleeps. Oxygen is most requisite for this building up of nervous energy, and, therefore, pure air in the sleeping rooms must be provided. It is more than probable that excess of carbonic acid, and of the impurities thrown off in respiration, prevent the proper restoration of nervous force; so that, even though the oxygen be not defective in quantity in the air of the sleeping chamber, still there should not be any excess of the products of respiration. Moreover, whilst the

organism is sleeping, the forces of resistance to disease are lowered; there is a diurnal variation in the vitality as in the temperature of the body.

Dampness of residence acts injuriously in three ways at least. It causes more loss of heat by radiation from the surface of the body, and, therefore, excessive expenditure of energy in one special direction—a thing to be avoided even in the most healthy. Again, damp walls prevent proper ventilation. Normal ventilation of residences takes place through porous walls, as well as through actual crevices, doors and windows. Further, it has been shown that damp walls are favourable soil for the growth of bacteria, and probably of pathogenic organisms. Humidity is decidedly a predisposing cause of some causes of disease, as well as a depressor of general body health. Its influence in the promotion of phthisis is incontestably established.

**Clothing in health and disease.**—The surface is so soon chilled in infants that great pains should be taken to protect every square inch against transient changes of temperature. The amount of clothing must vary with the temperature of the environment. The cutaneous area should yield a certain amount of heat in a certain space of time. To sudden demands for more, objection should be made. The long clothes of the new-born are unscientific and unreliable. The great mortality in the first year of life is partly produced by the absurd fashion of dressing. The neck and arms and hands of the new-born must be covered. The belly, buttocks, thighs, and legs of older children must be protected. The best material is animal wool (Jäger or Osterode). Flannel of good quality and texture is not thereby condemned. There is no scientific reason for keeping the belly bound down and tightly covered. Napkins are a necessary nuisance in babies, since it is impossible to avoid accidents during the first year. A combination garment of wool or flannel, with long sleeves

and gaiters, gloves and socks, seems to be the fitting raiment for all children.

By a simple arrangement of buttons or strings or ribbons —a few safety pins are alone admissible—this combination could be taken off and put on without trouble. Drawers made in two pieces so that they may not become wet or soiled are now in use for children wearing diapers.

The night dress should be pyjamas or a simple sack, with sleeves but no legs ; a draw-string at the bottom seals the sack, and prevents exposure of feet and legs. This may be made of wool for winter, and of linen for summer wear. A thin flannel vest may sometimes be worn at night in addition, and this should cover the surface of chest and back and belly. Night clothes are worn only at night. The clothing must be changed frequently enough to keep it sweet and clean. Extra clothing for out-door use should not be donned till necessary, and should be doffed immediately on return.*

Shoes must be easy-fitting, to allow of the free play of the foot, but not loose enough to hamper the gait.

For premature infants or collapsed ones a uniform coating or artificial skin of cotton wadding is best, and should be applied everywhere, except over the orifices of the body. The mechanical nurse or couveuse† is an excellent apparatus.

Warmth, at all costs, must be obtained for cases of palsy or defective circulation. This may be secured by worsted stockings of double thickness, by quilting two together ; or these lined with cotton wool, or with heated bran or camomile flowers. Hot bottles *near*, but not in contact with, the limbs may be required.

In cases of eczema and raw surfaces, cold and wet and the atmosphere must be excluded by ointment and lint, or by soluble varnishes.

* See Author's *Health of Children*, London, H. K. Lewis.

† Hearson's patent, Regent Street.

Diarrhœas always therapeutically demand a uniform temperature of the belly to prevent peristalsis and increased intestinal secretion. Rest in bed fulfils most requirements, but swathing the belly in flannel, or cotton wool and flannel, goes more directly to the point.

**Fresh air.**—A vitiated atmosphere would cause certain death to infants by protracted poisoning; even an hour of it must deteriorate vitality. Vitiation is due to organic emanations rather than to defect of oxygen and excess of carbonic acid. These organic excreta are allied to the fatty acids. The clothes of anyone are saturated with such products, and furniture and fomites absorb them and give them off. Disinfection and cleansing of furniture and clothing are, therefore, scientifically justified. Bad air may *lower* vitality, or *pervert* it, and induce positive disease. The atmosphere may become vitiated in an infinite number of ways.

Ventilation is conspicuous by its absence in many nurseries. Many day and night nurseries breed disease rather than children. Air closely confined within the curtains of the bassinette, and malodorous with soiled napkin, must be highly prejudicial to the depuration and oxygenation of the infant's blood.

Temperature, chemical composition, and hygrometry must all be taken into consideration. Our aim should be to provide an atmosphere not too cold, nor too moist, nor too warm, nor too dry, but just warm enough, and just dry enough. Dirt, too, is a great enemy, and filtration of the air is highly desirable. In chest disease respirators should be worn over the mouth and nose.

*Cubic space.*—A thousand cubic feet per head is not too much for the nursery, and then ventilation is necessary. Trust cannot be reposed in "natural" ventilation, in the winter at least. Raw materials, indeed, does nature supply in her most inclement moods.

The Temperature of the room should be about 63° F. Tobin's tubes are useful, and prevent some mechanical impurity of the air. A cheerful open fire is more agreeable than scientific. Unequal warming and variable currents of air are its objections. The modern stoves are safest and best, and most scientific. In these the air is heated before entrance, and the necessary moisture is kept by means of a basin of water. A thermometer and hygrometer render more exact information.

**Gymnastics and exercise.**—As a principle of general application, it may be stated that no agency capable of acting on the bodily functions is an unmixed good or evil. Great is the good gymnastics may effect in many diseases; second only to exercise in the open air, it ranks high as a therapeutic agency. A little physiology puts it on a proper basis; but in practice system is everything. "Try gymnastics" is very good advice; but the thing is how, when, where? The exercises must be adapted to each individual case. Every carefully and neatly performed muscular act is a gymnastic exercise; muscle is not alone acting; nerve centres and paths come in for the training; blood and blood-vessel enter into the education. Every action involves some neuromuscular apparatus, is attended by physiological nerve and muscle hyperæmia, physiological nerve discharge and muscular contraction. Each careful and neatly performed contraction means a definite co-ordinated nerve discharge; this is accompanied by an equally harmonious chemico-physical change in nerve and muscle. So the whole body benefits, for nerve, muscle, and circulation are actually, and excretion with assimilation indirectly, involved. The influence of *habit* is of immense importance, and applies everywhere in physiology and pathology. One disorderly movement is as bad as one orderly movement is good; a neat and harmoniously performed mental or muscular act is a

power for good; and conversely, clumsiness perpetuates itself.

The increased respiration and circulation, and augmented perspiration that attend muscular movements are of therapeutic benefit. But here I would deal only with the great good the nerve centres and muscles gain by harmonious perfectly co-ordinated muscular acts. This perfect performance must never be done to the point of prostration or fatigue. Palpitation, as a rule, interdicts gymnastics. Muscle and nerve may atrophy from excessive employment. Prostration or fatigue also act adversely on *nearly all* other corporeal processes.

*In nervous debility.*—Feeble-minded, backward, choreic, and neurotic children have their brains, cords, nerves, and muscles improved by instruction in calisthenics or gymnastics.

This gain is chiefly the result of the direct or special action of the exercises. To effect this the TRAINING, the neatness and perfection of the co-ordinate movements is most wanted.

*In general debility.*—Scrofulous, anæmic, feeble-bodied children reap benefit chiefly by the indirect or general action of gymnastics, by the increased circulation, respiration, excretion, and secretion caused by the muscular movements. Under these circumstances co-ordinate movement, training, is of less value than the mere action or motion.

*Methods.*—Professors of calisthenics justly and properly exist. Deportment in standing, walking, and performing movements with ease and grace is an art. Nature is not always graceful, harmonious, and artistic. The exercises must be taken as school lessons are or should be. Children may be cured of stammering by being taught *how* to breathe and *how* to articulate by a master of elocution. In performances of any kind the aim should be to do them as perfectly as possible. Bending the arm seems a simple act, but it may be performed well or ill.

The time occupied in these active exercises should be in proportion to the strength of the patient. Ten minutes may be enough. Repetition should be daily, or twice a day, or three times a week, according to circumstances and requirements. The room should not be dusty or ill-ventilated; this is most important in lung affections. Deformities of chest are decidedly cases for calisthenics and special gymnastics. Some of the mechanical appliances at gymnastic institutions may prove valuable. There are a thousand movements to practise, from simple to very complex. Athletic sports are not fit for sickly children, the strain on heart and vessel is too sudden, too great, and too prolonged.

Flexions and extensions and rotations of joints and trunk should be deliberately performed; indeed, deliberation at the outset of learning is a necessary factor of success. The exercises are arranged to bring any group of muscles and corresponding nerve centres into action. Ordinary drilling is very good for the general effects of gymnastics. When the gymnastics are ordered for cases of palsy, special movements are practised. Attitude requires attention. One group of muscles acts better in one attitude of the body, another in another.

Taking deep breaths, standing at attention, throwing the shoulders back, bending the trunk forwards for the hands to touch the toes, neatly extending the arms from the trunks—are useful movements. The mode of execution is important, it should not be too rapid, nor too forcible. The movement should be commenced well and quickly, but not abruptly; and finished more gradually. No healthy process, and very few, if any, morbid processes, finishes as suddenly as it may begin. Each movement should be repeated in the same time as the previous one. All these and other points are needed to educate the nervous centres and muscles up to the right standard.

Counting and singing are excellent means for securing harmonious and regular action. Reading aloud and elocution are valuable training for choreoid individuals as prophylactic and preventive of relapses. The brain, medulla, nerves, and muscles are thereby trained and better nourished.

Such apparatus as dumb-bells of proper weight, Indian clubs, trapeze, horizontal bar, parallel bars, go-cart, bicycle worked by hand-treadles or foot-treadles according as action of the arms or legs is desired are sufficient for most cases.

*Climacteric—Leaping and bounding periods.*—The tendency for the constitution to alter, for diseases to disappear or appear about the age of seven and fourteen, is not imaginary. Great changes occur in the organism at these epochs. This widespread transformation often swamps local and general lesions in its universal commotion, or, on the other hand, may educe inadequacy in one or other part.

The blood-making and nutritive viscera: Spleen, thymus, thyroid, lymphatic tissues, and liver, are large and active until puberty, when the seats of greatest activity change: the intellect develops, the genitals evolve, the heart doubles its weight, and the arterial blood pressure is raised.

## CHAPTER II.

### THE PRINCIPLES AND PRACTICE OF FEEDING INFANTS AND CHILDREN.

**Human milk is the type of infants' food.**—All artificial foods should conform as closely as possible to this prototype. The resemblance must be not only a chemical, but also a physical one. The clotting in human milk results in fine flakes, and this should be obtained when artificial milk is given. The specific gravity of good human milk is about 1030. It contains rather less than four per cent. of proteids; rather more than two and a half per cent. of fat (hydrocarbon); and rather less than four and a half per cent. of sugar of milk (carbohydrate); about one and a half per cent. of salts, and about 88 per cent. of water. The proteid and carbohydrate are nearly the same in quantity in the infant's diet, whilst in the adult standard diet (Ranke) the proteid is to the carbohydrate as one is to three. The fat in the standard infant diet is relatively twice as much as in the standard adult diet. The most important salts in the milk are phosphates and chlorides, and chiefly those of potassium, sodium, magnesium, lime and iron. It may be remembered that the solids of the blood and tissues are richest in potash salts and phosphates, whilst there is a predominance of soda salts and chlorides in the fluids of the body. The mother's milk is the best.

The *digestive and assimilative* organs of infants are of more *immediate* importance in the economy than any other set of organs. The body has to build up rather than break down. No doubt the expenditure is large, but the income must be much larger. The digestive organs have to prepare

plenty of material for constructive purposes ; the body grows very rapidly, and the brain nearly doubles itself in weight in seven years. The feeding is more frequent, and the bowels act rather more frequently in young infants. The liver is very large, relatively and absolutely, because its metabolic functions are very active, and the amount of material manufactured great. The caput cæcum coli is not developed ; this is related doubtless to the efficiency of the peristaltic action and the frequency of action of the bowels, which prevents any fæcal accumulation and gaseous generation in the first part of the large bowel. The sigmoid flexure and rectum are thrown into folds as the result of a greater relative length of these parts of the bowel in infancy. Constipation is promoted by the presence of these twists and turns in the last part of the large bowel (see Prolapse of Bowel and Constipation).

**The mother as a nurse.**—It is good for the mother to nurse her offspring, for suckling favours the involution of the uterus. The infant should be put to the breast a few hours after parturition ; this promotes uterine contraction for the mother and peristaltic action for the infant. The milk in the breast for the first two days is a thick yellowish fluid called colostrum. It acts as a natural and mild aperient. It contains a great number of large corpuscles filled with fatty globules—the " colostrum corpuscles." There being nothing but colostrum for two days, it follows that artificial feeding of the newborn with gruel, butter, sugar, and the like, is utterly condemned by Nature herself. An absence of secretion on the third day should be an indication to give the infant milk and barley water, one part to two, sweetened with sugar of milk. The secretion of milk a day or so later is a sign to discontinue all artificial feeding. After the proper secretion of the milk has begun its physical characters change. It is a bluish white fluid containing an abundance of minute spherical

globules consisting of fat coated with casein or alkali albumen. A few colostrum corpuscles are also present, but these should not be found after the first month. An analysis of the mother's milk shows that it does not remain of uniform character. The amount of casein is small during the first month, but it increases during the next month or two, and then remains constant. The salts also increase in quantity for a month or so. The lactine, however, is in greatest abundance during the first two months, and diminishes somewhat afterwards. The amount of fat varies considerably from time to time, and this variation is probably due to alterations in the quantity and quality of the mother's diet. The *influence of menstruation and of a fresh pregnancy* on the milk is a matter requiring further elucidation, but as a rule the occurrence of either event should be regarded as an indication for weaning the child. The quantity and the quality of the milk varies at different times in the same mother, and there are also considerable differences in the milk in different individuals. Signs of exhaustion in the mother are indications for reducing the number of daily nursings or for suspending them entirely. If there be an excessive flow of watery milk *(galactorrhœa)* during the first few weeks of suckling it is a sign that the mother is unfit to suckle her offspring, and a discontinuance of the nursing should be advised. Even when the mother is willing to suckle her offspring the milk may be insufficient in quantity or defective in quality. If merely insufficient in quantity the child should have what there is. And the quantity may often be increased by the mother's taking a cup of milk or gruel half an hour before suckling. Defective quality of the milk may not be so easily managed. This defect may be known by the child's not thriving, by its crying and not gaining weight; or physical and microscopical and even chemical examination may be practised to ascertain the nature of the defect. The diet of the mother should be

inquired into. The food of the mother should be abundant, of simple kind, and nutritious. It should be taken at regular intervals. Highly spiced, smoked or cured, rich or stimulating articles of diet should be avoided. Beer as a rule does not make good milk, but a little stout is a great help to some women.

Fresh air is as necessary for the mother as for the infant. The maternal alvine evacuations should be absolutely regular. I find that oatmeal porridge for breakfast corrects a liability to constipation not only in the mother, but also indirectly in the infant. Daily exercise in the park promotes a healthy state of the lacteal secretion. Attention should be given to the dentistry. Carious teeth should have the dentist's advice and attention. The mother's breath should be sweet.

Anything calculated to excite or depress the nervous system of the mother should be sedulously shunned. Mental emotion is said so to have altered the character of the milk that serious disturbance of the child's health has resulted, and convulsions, nay, even death, have been attributed to this cause. The mother should have a sufficient amount of sleep every night, and the feeding should be so arranged as not to deprive her of a continuous sleep of at least six hours. This rule is often broken during the first month with advantage to the child, the mother often seeming inclined to wake in the middle of the night, and this without there being any cause for anxiety.

Certain local conditions of the breast may interfere with the proper performance of lactation. Depression of the nipple may usually be overcome with perseverance. The nipples should receive attention during the last months of pregnancy. They may be drawn out with the thumb and finger, or the common breast pump may be called into requisition. If the nipples be tender they should be hardened by the use of evaporating lotions composed of equal parts of

brandy or rectified spirit and water. Excoriated and fissured nipples require much attention. They may cause serious interference with lactation. The best method of treating them is to apply the solid stick of nitrate of silver to every part of their surface and to every crevice and corner. This coats the surface of the sore with albuminate, and thus forms a protection from the atmosphere. At the same time the caustic cleans the impurities from the surface, and by its stimulant character promotes the healing of the sore. If the fissure or excoriation be very slight a metal or glass breast-shield may enable the child to suck the milk without causing the mother much discomfort. But as a rule the pain of these apparently trivial cracks is great, and the possibility of irritation leading to the development of an abscess has to be borne in mind. One factor in the causation of an abscess is the tension due to unescaped milk.

If the mother be suffering from marked *phthisis* the baby should be brought up by hand. The milk is frequently of poor quality in phthinoids, and the suckling can but still further lower their vitality. Constitutional *syphilis* in the mother need not prevent her from nursing her infant. She should be treated with specifics, and it may be necessary to treat the baby directly also. But sometimes the mercury taken by the mother acts through the medium of the milk on the child. Should the mother's health be seriously lowered from any cause, lactation should not be practised. The presence of *inflammatory disease* in the mother is, in my experience, also an indication for her not suckling the child, the milk being deficient in quantity and likely to be deteriorated in quality in these affections. The development of a mammary abscess in one breast is a contra-indication to nursing with that breast, which should be treated with glycerine of belladonna and fomentations, and surgical treatment, if necessary, sought.

Erysipelas also in the mother spoils the secretion of milk and renders what is secreted unwholesome.

Becquerel found that the fatty matter of the mother's milk was increased in quantity as the result of all acute and chronic diseases, with the exception of syphilis and advanced phthisis. Acute diseases are also characterized by an increase of casein, and chronic diseases by a remarkable diminution of casein.

**Method and times of nursing.**—Each breast should be used alternately; generally a healthy suckling practically empties a breast at a time. The infant should be supported on the same arm as the breast to be used. The mother should hold herself a little downwards, so that the nipple may be easily grasped. The breast should be steadied by the index and middle finger of the free hand. Pressure on the gland may assist a feeble suckling. Pressure at the base of the nipple may moderate the flow when sucking is too vigorous; choking or vomiting announces this fact. During the first week or two the infant should be put to the breast every two hours from 4 a.m. to 10 p.m., leaving the mother six hours' good rest. Later on, and by gradual increase of the interval, the breast should be given every three hours by the end of the *second* month.

Thus the *habit* of *regular feeding* and *sleeping* is generally readily established.

No laws are hard and fast rules. Individual peculiarities sometimes exist even in the new-born. A few infants thrive well enough on less frequent feedings, and others on smaller doses at shorter intervals. Do what we will, a single meal in the middle of the night may be necessary. And these peculiarities in feeding may vary with the season of the year and even from week to week. The meal taken at each nursing should be augmented as each day passes. This extra

demand Nature meets by increased secretion of richer milk. Doubtless the sucking develops the function of lactation. As a rule, at seven months other food may be given (see p. 30), and weaning should be gradually accomplished by the end of the tenth month. The interval of feeding may be increased to three hours and a half if possible. At ten months the rate of feeding should be every four hours.

The weaning may be best effected thus:—One meal only from the bottle for the first day of the weaning period, then two on the second day, and so forth. But a difficulty in getting the infant to take the bottle or spoon should be met by abrupt weaning. The smearing a little aloes on the breast is unnecessary.

If the mother's milk be not available, then a *wet nurse* should be obtained.

In the *selection of a wet nurse* an eye should be had mainly to the general health of the proposed wet nurse and her infant. She should be between twenty and twenty-five years of age, have previously had a child, a brunette, or of the same complexion as the mother, of strong constitution, never having had a serious illness, and always well nourished, with small mammæ that yield an abundant supply of milk. She should be procured about three months after the birth of her own child, for the milk is then likely to be of uniform quality. Menstruation should not have reappeared. Three months are allowed to elapse after the birth of the woman's child before selecting her as the wet nurse in order to ascertain whether there have been any signs of syphilis either in the parent or offspring. Moreover, we can then judge of the value of her milk by the condition of her infant, and the state of her own health is the more likely to be assured. Sometimes the milk of the wet nurse does not agree after a month or so has elapsed. This difficulty may be surmounted by some alteration in her diet. But it frequently indicates

the need for another nurse. The diet and mode of life of the wet nurse should conform to the same principles as those laid down for the mother when nursing.

Wet-nursing sometimes proves a failure. Where the expense does not preclude its use *asses' milk* should be tried. It approximates in chemical composition to human milk, but contains rather less fat and proteid. *Goat's milk* is richer in proteids and fats than human milk ; but children have been successfully reared on it. The reason why children thrive on these milks and not on cow's milk appears chiefly to depend on the different kind of clots that are formed as the result of the action of the gastric juice. Cow's milk clots, if not guarded by mucilaginous fluids, in putty-like or wet cheese-like masses. Asses' milk gives a looser, more flocculent curd. So does goat's milk sometimes, and my experience does not tally with that of Dr. Cheadle, who believes that goat's milk clots as densely as cow's milk. In some cases of curd vomiting not even human milk is retained ; feeding on barley water or chicken tea is most often the correct treatment. The strong flavour of goat's milk and the laxative property of asses' milk are generally destroyed by boiling. Too frequent feeding hampers the movements and chemical processes in the stomach and intestines, leads to irritability, sleeplessness and screaming, and soon sets up actual catarrh.

But if neither asses' milk nor goat's milk be used, then *artificial human milk* should be tried as the next best substitute for the mother's milk. It requires more trouble than the poorer classes are able to bestow on its preparation, but a good nurse may manage to make it regularly.

Cow's milk contains about one-third more casein and one-third less sugar than human milk. The following is Frankland's method of preparation of artificial human milk :—

" Allow one-third of a pint of new milk to stand twelve hours ;

remove the cream and mix it with two-thirds of a pint of perfectly fresh cow's milk. Take the blue milk from which the cream was removed and put a piece of rennet about an inch square (fluid rennet may be employed) into it. Keep the vessel containing it in a warm place until the milk is fully curdled, an operation requiring five to fifteen minutes, according to the activity of the rennet, which should be removed as soon as the curdling commences. Break up the curd repeatedly, and carefully separate the whole of the whey, which should then be rapidly heated to boiling in a small tin pan placed over a spirit or gas lamp. During the heating a further quantity of casein, technically called "fleetings," separates and must be removed by straining through clean muslin. Now dissolve 110 grains of powdered sugar of milk in the hot whey and mix it with the two-thirds of a pint of new milk to which the cream from the other fluid has already been added as already described. The artificial milk should be used within twelve hours of its preparation, and it is almost needless to add that all the vessels employed in its manufacture and administration should be kept scrupulously clean."

If artificial human milk be not employed, then *diluted cow's milk* should be essayed; "one-third more casein and one-third less sugar" represents the chief chemical difference between cow's milk and human. This must be remembered in order to write prescriptions.

But chemistry alone will not do; physics is also necessary in the scientific nursery. The clot of cow's milk is too compact and close. How is this remedied? (1) By mechanically preventing the particles of casein from running together so closely. (2) Chemically preventing coagulation by the use of alkalies.

This last method appears to me to be radically wrong. It would require so much alkali as to neutralize and paralyze

the gastric juice. Lime water would have to be used of a quantity equal to one-third of the meal. Some use bicarbonate of soda, about a grain to each ounce, or five drops of the liquor calcis saccharatus B.P. to each ounce.

**Small doses of mucilage simply used mechanically.**—The mechanical method is best, and barley water the most useful and easily obtained mucilaginous agent. But it should not be too thick. Two teaspoonfuls of Scotch or pearl barley to a pint of cold—previously boiled and filtered—water are boiled in a clean saucepan down to two-thirds of a pint. After straining through muslin the liquor may be used.

Gelatine or isinglass is sometimes useful. A square inch of the former or a corresponding amount of the latter may be soaked in cold water for three hours ; then the mixture is put into an earthen vessel and the latter into boiling water till the gelatine is solved. A teaspoonful or more, according to the quantity of the meal, of the resulting jelly will serve the purpose.

Mellin's food, or other malted food, dissolved in hot water may be used with the same object. A teaspoonful will suffice for each meal. If the very starchy unmalted foods are used they should be boiled for several hours so as to make a mucilage. Mucilage of acacia or tragacanth is also recommended by some ; a dram of either would be suitable for an ordinary meal. Barley water is the best and most useful. I use it not only for its mechanical property, but also as the diluent. In my experience few sickly infants have the power of digesting the cow's curd with ease and comfort; simple watering does not prevent the compact clotting.

Some children may be able to digest cow's milk simply diluted with water, no attempt being made to prevent the casein from running together into a firm clot.

The *quantity* of the food mixture required at different months is very variable. Scientific data are still deficient.

Twelve ounces a day is about right for the first week. The quantity may roughly be said to increase at the rate of four ounces each month. At the seventh month thirty-five to forty ounces is about the right quantity. Later as much as three pints may be ingested in the twenty-four hours. The *times* of feeding should be as at the breast—every two hours night and day for the first week; every two hours from 4 a.m. to 10 p.m. for the rest of the month; then every two hours and a half for second month and every three hours for third month. The first meal should be at 4 a.m., and the last at 10 p.m.

Thus six hours' rest are secured for the mother. Some give the last meal later. I prefer it earlier because—though there are no scientific data—I believe that before the dead of night sleep is more refreshing; we are such stuff as dreams are made of; some individuals cannot sleep except in the magnetic line; small items may make great differences.

It is impossible and unreasoning to lay down absolute rules. The quantities and methods given above are only averages. The size of the infant, its mental and bodily activity, its capacity for digestion, and individual peculiarities are such elastic factors. Each child must be considered as a concern in and of itself.

The following **Schema of Diet** is therefore not inflexible, and should only serve as a guide.

*First week.*—Thin barley water and cow's milk, of each four drams; sugar of milk, fifteen grains; every two hours night and day.

*Rest of first month.*—Thin barley water, five drams; cow's milk, six drams, with fifteen grains of sugar. Meals every two hours from 4 a.m. to 10 p.m.

*Second month.*—Cow's milk, nine drams; barley water, six drams; water, three drams; cream, two drams; sugar of milk, twenty grains; every two hours and a half.

*Third month.*—Cow's milk, twelve drams; barley water, six drams; water, six drams; cream, three drams; sugar of milk, half a dram; every three hours.

*Fourth month.*—Cow's milk, sixteen drams; barley water, six drams; water, eight drams; cream, four drams; sugar of milk, forty-five grains; every three hours.

*Fifth month.*—Cow's milk, eighteen drams; barley water, six drams; water, ten drams; cream, five drams; sugar of milk, one dram; every three hours.

*Six month.*—Cow's milk, twenty drams; barley water, six drams; water, ten drams; cream, five drams; sugar of milk, one dram; every three hours.

The importance of aseptic cleanliness is truly tremendous; an eye is to be kept on the dairyman's utensils.

It is well to supply one's own milk cans, and see that they are kept for one's own use; in hot weather the milk should be boiled and kept in a refrigerator; the refrigerator is best kept outside the nursery, and not in a dusty place; the lid should always be kept down.

Lime water is useful for neutralizing acid cow's milk—slaked lime one ounce, and distilled water four pints. It must be kept carefully stoppered.

Cow's milk rapidly undergoes lactic acid fermentation. This acidity checks the secretion, and fermentation hinders the action, of the gastric juice. Hence all this cleanliness.

*Condensed milk* may have to be employed, and is sometimes very valuable. If sweetened condensed milk be used, then half-a-teaspoonful to three tablespoonfuls are the usual proportions for the first week. This does not contain enough casein or fat, and so the addition of ten drops of cream is needed. Later one teaspoonful may be given in four or five tablespoonfuls of water. Nestle's Swiss milk requires still further dilution. At the seventh month, a teaspoonful to two tablespoonfuls would be an average quantity. The

quantity of fluid taken should be about the same as when diluted cow's milk is used; but cow's milk should be tried from time to time, in order to displace, if possible, the condensed milk. Happiness, and growth in size, and increase in weight may be seen with condensed milk feeding; but often too much fat is formed, and the child is apathetic rather than comfortable and lively. A child brought up for seven months on condensed milk runs the risk of becoming scorbutic, or rickety, or both. The sugar is often used to prevent constipation; but it fattens the child by laying hold of the oxygen required for breaking down albumens.

If cow's milk cannot be borne by the infant, it is a good plan to let it have besides the dilute Swiss milk, or with it, a little white of egg or raw meat juice. Half-a-dram of either may be added to each or every other meal according to the powers of proteid digestion.

The raw meat juice may be expressed by a machine after mincing. A simple plan is to take a quarter of a pound of raw meat and thoroughly shred or mince it in a saucer, then cover it with pure cold water, set aside for an hour in a cold larder, and finally strain it through muslin; it may be sweetened with sugar or glycerine when given alone.

As a golden rule, no other food than milk should be given till the age of seven months.

*Strong barley water* or *jelly* is made from pearl or Scotch barley, one ounce to a pint of water, boiled slowly till the quantity is reduced to three-fourths of a pint, then it is strained and set aside to cool. This food, being almost pure carbohydrate, requires cream and a little albumen.

In temporary gastric disturbance, with indigestion of fat and proteid, this barley jelly may be given, diluted and slightly sweetened, for a day or two.

*Mutton broth* and *vegetable soup*, carefully strained, are also valuable for tiding over temporary difficulties.

*Mellin's food* contains abundance of soluble carbohydrate, but insufficient nitrogenous matter, and practically not any hydrocarbon. Diluted with cow's milk, it is still wanting in fat, and contains too much sugar. But it is a valuable food, as it presents the carbohydrate in a soluble form, whereas the other foods are less soluble. Most of these foods are deficient in nitrogenous substance and fat, but in suitable proportions they may be employed with diluted milk.

*Whey* from cow's milk may be given, but some proteids and fats will still be necessary. The cream and whey may be mixed as in artificial human milk, but some white of egg should be substituted instead of the fresh cow's milk. Sometimes whey mixed with a few teaspoonfuls of boiled milk and a little cream, will be kept down when simply diluted cow's milk is not. I have also tried with success the raw yolk of an egg with whey ; there is plenty of fat and nitrogen in this mixture. Barley water may be strengthened in fat by adding a little yolk of egg or cream. *Oatmeal water* is also of value ; its chief constituent is carbohydrate. Two tablespoonfuls of oatmeal should be boiled in a quart of water for four hours, and even longer ; then strained through muslin ; the liquor that filters through is used. Peptonized milk and peptonized gruel are other resources when the food passes through the intestines undigested.

More will be said of these methods of feeding under the heading of athrepsia, diarrhœa, and other diseases. Beef-tea, mutton broth, mutton jelly, soups, calf's-foot broth, and other stimulants and foods are sometimes used in the bringing up of the hand-fed infant ; but their mode of preparation and special uses will be more conveniently considered in other places.

Voltmer's artificial human milk* certainly deserves a trial ; it has been in use for some years in Germany.

* Agent, Hardman, Birmingham.

"*Strippings*" is another useful food when there is indigestion of proteids. "Strippings" is the name given to cow's milk drawn from the glands after the ordinary supply has been taken. It contains more cream, but less casein. Indigestion of fat or cream is of rare occurrence in infants. "Strippings" may, if necessary, be diluted with water, or whey, or lime water (if acid), or thin barley water.

*Food warmers and preservers* are condemned as germ incubators. The food should be made fresh each time, for in any food-warmer fermentation necessarily follows the preservation of the food. Water may easily be made hot in a few minutes with a spirit lamp or fire. Condensed milk and Mellin's food, with grape juice or orange juice in small quantities, given separately from the other foods, are the best for *long journeys* or voyages in early infancy.

The *temperature* of the food should be about 95° F.

The *reaction* of all foods should be alkaline, or at least not acid. Cow's milk from London stalls is frequently acid; this is undesirable, and if such milk has to be used lime water should be employed in sufficient quantity to neutralize the acidity of the milk. But except for this purpose, and when it is employed to remove the aperient tendency of asses' milk (which tendency may also sometimes be removed by boiling), lime water should not be used in the hand-feeding of children. Lime water as preventive of the formation of hard clots does not appear to suit nearly so well as barley water or Mellin's food. I have frequently merely effected this substitution, and with great benefit to the child.

*Constipation* occurring in hand-fed children is a peculiarity scarcely deserving the name of disease, but doubtless it points to a tendency thereto. It may be relieved, if not obstinate, by placing a pinch of phosphate of soda or carbonate of magnesia, or a teaspoonful of Dinneford's fluid magnesia in the milk at two or three meals.

The ordinary *feeding-bottle* carries with it one great disadvantage. It is almost impossible to keep the tube and other not easily accessible parts of the bottle clean. Consequently I never use the bottle with the tube. The old-fashioned slipper-shaped bottle is the best. It is true that the flow of milk from it is sometimes too easy; but this difficulty may easily be overcome by tilting the bottle less or more according to the vigour of sucking.

Conical teats are better than the pyriform, as being more easily turned inside out and cleaned. Plenty of teats of soft india-rubber, with a moderate-sized opening, not allowing of flow by mere gravity, are required; and one that has been used several days should be replaced by a new one. Even with this bottle great care is necessary to keep the parts clean and prevent the milk becoming sour. At least two bottles and teats should be in use. After use the bottle should be thoroughly swilled out with plenty of cold water and some sand to clean it. It may be kept in a large basin of cold water, to which a dram to the pint of either salicytate of soda or bicarbonate of soda is added. Any curds or particles of milk rapidly become sour, and soon impart sourness to all milk that comes in contact with them—a little leaven leaveneth the whole. The "baby fascinators," or teats, should not always be in the child's mouth. The teat should be everted and thoroughly cleansed, and remain everted in cold water till wanted.

There should not be the faintest odour of sourness about the feeding utensils. All spoons and vessels used in the preparation of food require similar studious cleanliness. It is next to impossible to keep the whole day's supply of food sweet from morning to night.

In preparing artificial food, *measurement* is most necessary. The food should be prescribed in stated doses, and should be measured with an ordinary graduated glass measure, kept

scrupulously clean. Tablespoons may be used, but it is time in this scientific age that measurement should reach to the lowest strata of society.

The best posture for the feeding child is the reclining one in the mother's lap, at an angle of about 45°. The bottle should be held horizontally at first, or even tilting slightly downwards, if the child is very vigorous. As the meal progresses the tilting is gradually reversed. It is impossible to prevent some air from being swallowed, but by keeping the neck of the bottle always full, this is prevented to some extent. The food must be taken leisurely, not less than ten minutes being spent over the meal. This duration is effected by occasionally withdrawing the bottle for a minute or so, should the sucking be too rapid. The practice of letting the child suck the empty bottle is bad, because the child swallows air and distends its stomach. Constant crying is generally a call, not for food, but for rectification of feeding, and attention should be given to the details described in the chapter on Indigestion.

**Diet at and after seven months.**—When the teeth begin to appear, and the salivary glands to develop (phenomena which I believe to be correlative), some solid, but particulate, food may be administered. Chapman's Entire Wheat Flour and Mellin's Food are those I prefer. The former contains the pollard, or outer part of the grain, and is rich in albumens, fats, and salts; it contains also a diastatic ferment, cerealine, which tends to convert starch into dextrin and maltose. Sometimes a mixture of Savory and Moore's with Mellin's, in equal parts, has proved more useful. Nestle's Food may sometimes prove more successful. A small tablespoonful of any of these should be given according to the directions on the tins or bottles; and this should be the mid-day meal. Several of the other infants' foods are most unsuitable, in my experience, if given to infants under the age of one year, and

even after this age they are not so good as other foods. Constipation is very frequent with their use, even when they seem otherwise to be suitable. I have seen many cases of athrepsia, in infants under the age of seven months, for which no adequate external cause but the objectionable infants' foods could be assigned. Mutton broth or jelly, made from the shanks of mutton, may be given after seven months. Despite physiological teaching that gelatine is of no use in building up tissues, it must be regarded as a valuable food. When the child is weaned, a custard pudding—one egg to half-pint of milk, and a little sugar—may be allowed every day. Milk, however, should still form the staple of the diet. About three or four parts of cow's milk to one of water is the usual proportion for seven months and ten months respectively.

**At and after 12 months.**—The cow's milk may often be given undiluted about the age of one year. The bottle should be dispensed with, and a cup or feeder used instead. The food may now consist of proteids, fats, and carbohydrates derived from other sources than milk. Eggs may supply proteids and fats. If it seem necessary or advisable, there is no objection to a little mutton, and mutton fat even at 12 months, but generally the giving of actual meat or food should be postponed till 18 months. Red meat gravy with a little fat from the joint may be given. The meat should always be minced and the flesh pounded. Breast of chicken, mashed cauliflower, mashed mealy potato may all be employed. The great principle is to prescribe food which, when in the stomach and duodenum, shall present the largest possible surface to the action of the digestive juices. The giving of slices of bread and butter under the age of two years is injudicious. If the bread be at all new, large lumps are formed, whose exterior alone comes into efficient contact with the digestive juices. The interior of these lumps undergoes fermentative

processes with the development of irritant products which excite catarrh of the mucous membranes and cause nervous disturbances. The bread should always be second, indeed I prefer third day's bread, and it should be crumbled into the plate before allowing the child to eat it. Kept bread becomes drier and less coherent, "crumbly," and therefore easily broken up into particles, whose collective surface area is very large and extensive, enabling the digestive juices to attack at once a large amount of material.

When the teeth are fully developed and fill the jaws, the child should be taught how to masticate. The object of mastication is to "pulpify" the food, and thereby to present the largest possible surface to the action of the digestive fluids. Henceforth most articles of diet may be allowed; but beer, wine, spirits, cheese, pastry, and pork should, as a rule, be interdicted.

**Foods.**—Chiefly albuminous are meat, poultry, game, wild fowl, fish, milk, eggs, cheese, tripe, oysters.

Chiefly insoluble carbohydrates (starchy) are wheat, flour, bread, oatmeal barley, rye, Indian corn, rice, buckwheat, beans, peas, lentils, chestnuts, potatoes, tapioca, macaroni, sago, arrowroot. Chiefly soluble carbohydrates (dextrin and sugary) are biscuits, carrots, parsnips, turnips, beetroot, figs, honey, bananas, apples, treacles, manna, grapes, beer, cocoa, chocolate, and melons and fruits generally.

Chiefly hydrocarbons (fats) are bacon fat, mutton and beef fat, butter, cream, and eels.

Many vegetables, such as those in list two, contain a percentage of vegetable albumen or legumin, including also green vegetables, cabbages, spinach, broccoli, sprouts, watercresses, radishes, and tomatoes.

All foods also contain much water and salts of potash, sodium, etc.

The following are some useful foods and stimulants which are freely prescribed in many diseases. I have only given those that are most serviceable, and that I have used most.

*Bread jelly* is made by soaking the crumb of seconds flour, third day's bread, in cold water for eight hours. The water is then all squeezed out to get rid of lactic acid and other products of fermentation. The pulp is next placed in fresh water and boiled gently for half an hour, so as to burst the cellulose capsules of the starch granules. The water is then strained off and the pulp squashed through a fine hair sieve into a mould, where as it cools it sets into a jelly. Enough of this is mixed with warm water or milk to make food of a thin consistence. It may replace barley water.

*Oatmeal or barley milk* is made by boiling a teaspoonful of oatmeal or barley in four ounces of water for 15 minutes, and then adding an equal part of skimmed milk.

A good *veal, beef, and barley tea* may be made by stewing for six hours one pound each of fresh veal and fresh beef and two ounces of pearl barley, in three pints of water, it should be strained through a tammy, and be seasoned to taste; the resultant amounts to one pint.

*Port wine jelly* is made from half-a-pint of port wine, half-an-ounce of gum arabic and of isinglass, an ounce of sifted sugar, and a fragment of cinnamon. These should stand all night tightly covered up. Next day put the jar containing the ingredients into boiling water and simmer till all is dissolved, then strain and let it stand till cold. It may be cut into fragments for use.

*Whey* is easily made by adding three teaspoonfuls of wine of pepsin to a quart of warm fresh milk and allowing the mixture to stand at a temperature of 98° F. for an hour. The curd is removed by straining through muslin.

*White wine whey* is made from half-a-pint of boiling milk

and one glassful of sherry strained through a fine sieve and slightly sweetened with sifted sugar. It is a valuable food and stimulant in infants.

*Brandy and egg* is made by frothing three eggs, four ounces of cold spring water, two lumps of sugar, and stirring all together.

*Mutton jelly* is made by stewing six shanks of mutton in three pints of water, with half-a-pound of lean beef. The shanks should be soaked several hours in water, and scrubbed afterwards. The ingredients are simmered gently for five hours. Then the soup is strained, and the fat removed. A little pepper and salt to taste may be added. Portions may be warmed up as required.

To peptonize foods, Benger's liquor pancreaticus is the preparation I have usually employed. Half-a-pint of cow's milk, five ounces of boiling water, a teaspoonful of Benger, and ten grains of bicarbonate of soda are all mixed together in a covered vessel and placed near the fire under a tea "cosey." After the peptonization has continued for an hour the process is stopped by boiling the mixture for two minutes in a clean food pan. The food may be sweetened with sugar of milk for an infant. The same maker's pancreatic powder—or Fairchild's or Savory and Moore's pellets—may be used instead.

Pounded chicken and underdone pounded meat, mutton or beef, are frequently prescribed.

The following is an average DIETARY FOR HEALTHY CHILDREN above the age of two years :—

Breakfast at 8 a.m. Half-a-pint to a pint of milk, with two slices of bread and butter and a small cupful of well-boiled oatmeal.

Dinner at noon. Roast or boiled mutton, roast beef, roast chicken or turkey, three ounces ; mashed potato, four ounces,

with plenty of juicy gravy; a slice of dry bread, and three tablespoonfuls of custard or rice pudding or sago, with a little cream.

Tea at 4 p.m. Half-a-pint of milk, with two slices of bread and butter or rusk or dry toast.

Supper at 8 p m. Half-a-pint of milk flavoured with a little chocolate, and some dry biscuit or milk toast.

As a rule nothing but water should be allowed as a drink between meals. Some children digest the principal meal better later in the day—say at two or even four p.m. The nurse should see that the food is eaten leisurely.

*From four years of age to puberty.*—The staples for breakfast at 8 a.m. should still be milk, oatmeal porridge, bread and good butter or Devonshire cream. A little white fish, or eggs, or bacon, especially fat bacon, may be allowed also. Fruit is also good, such as apples, oranges, grapes, peaches, plums, pears, strawberries. The staples for dinner at one or two o'clock should be clear soup, roast meat or game, with a little fat, dry bread and potatoes, with some other vegetable, such as cauliflower, parsnip, broccoli, spinach, stewed celery, peas, beans, cabbages, or tomatoes. A little light pudding of rice and milk, or sago, tapioca, or stewed fruit with cream may also be allowed.

For luncheon and supper cocoa and milk, with bread and butter, dry biscuit, rusk, or toast with butter or cream may be allowed.

None of the dishes should be of the *entrée* or *rechauffé* description. Fried foods, sauces, condiments, or high seasonings are not permissible. When children have reached the age of puberty they may take most foods allowed to adults, though it should not be thereby inferred that the usual methods of feeding in adults are all that can be desired. By "fancy diet" is understood that which the child may feel disposed to take. It is ordered with a view to promoting and

pleasing the appetite, which, as we have seen, is a very important matter.

Meat, fish, flesh, or game may be allowed as albuminous bodies ; bacon fat, or cream, or fresh butter as hydrocarbons; malted rusks, or Montgomery's biscuits, with a little sugar or compôt of fruit, as carbohydrates. In many cases where fancy diet is ordered sugars and starches must be allowed in but limited quantities.

## CHAPTER III.

### INDIGESTION—DYSPEPSIA—SIMPLE GASTRIC CATARRH.

The *symptoms* of indigestion or dyspepsia, whether in infant or child, may be *one*, *few*, or *many*. Their nature is practically the same as in adults. Vomiting may mean nothing more than an overfull stomach in a healthy infant. In the new-born the stomach is almost cylindrical, without the curvatures, which are slowly acquired as months go by. The shape of the adult stomach, like that of the adult *caput cæcum coli*, is doubtless developed as a result of continued distension from feeding. In some small adult eaters the anatomical gastric outlines are but poorly marked. Like all reflex actions, emesis is more readily evoked the younger the infant is. As an *incomplete* rule, indigestion—gastric catarrh—is unattended with fever. It is, of course, frequent in fevers, but the degree of catarrh in these varies from slight to severe. Constipation, diarrhœa, or irregular action of the bowels may coexist with indigestion. Owing to the tendency of catarrh to spread, the younger the infant is the more is the likelihood of diarrhœa complicating indigestion. Symptoms at a distance from the stomach—sympathetic or reflex disturbances—are common. The brain and cord may show disordered action by restlessness and crying in infants, and by moping, languor, weakness of the legs, and lassitude in older children. The symptoms may be due to actual pain or morbid sensation, or to deterioration of blood caused by interference with the chemico-physical processes of digestion. The urine may be loaded with pale or pink lithates, and uric

acid crystals may be seen in the urine. Most likely the liver shares in the gastric derangement (see Biliousness). The nervous phenomena may include twitchings of face and limbs —clonic spasm—and carpopedal contractions—tonic spasm. Or there may be bilateral convulsions of mixed tonic and clonic spasm, with or without diminution or loss of consciousness. The younger the infant is the more frequent are these symptoms.

In *neurotic* children the symptoms are often sudden, paroxysmal, and entirely out of proportion to the exciting cause. Vasomotor phenomena—pallor more than flushing—and cardiac irregularity, or intermittency, or syncope may also be observed. Peevish cry, hot skin, acid eructations and sour-smelling breath are frequent symptoms. Gastro-intestinal colic is indicated by violent paroxysmal screaming, white or livid face, hard, tense and distended belly, cold feet and hands, and diarrhœa. The tip and sides of the tongue are often abnormally clean, and the fungiform papillæ enlarged. The dorsum of the tongue may be furred or clean, or show a "mapped" configuration. The "mapped" or "geographical" tongue is not pathognomonic of syphilis. The indigestion may be a thing of the moment, may last a week, or be prolonged for several weeks. If the last occurs in infants, athrepsia (q.v.) will be the result.

There may be *indigestion* of *proteids*, of *fats*, or of *starches*. Sometimes there is an individual peculiarity or idiosyncrasy, the infant or child being unable to digest milk of any kind, or only of one kind, and that may very rarely be the mother's milk. And yet the mother may be in perfect health, and obeying the laws of hygiene in every respect. The commonest form of indigestion in infants is indigestion of starchy matter—potatoes, the various infants' foods—the more so the less malted they are, tapioca, barley, sago, rice. The salivary glands are probably not fully developed till the mouth is full

of teeth, but the pancreas most likely acquires digestive powers over starches some time before this.*

The best guide to digestibility of any articles is the watching of the baby's *growth in stature and weight*, and careful *macroscopical*, *chemical*, and *even microscopical examination* of the *stools*. Mere increase in weight may be due to increase of fatty subcutaneous tissue—as often as not a sign of faulty kinds of food. These fat flabby ones (polysarcia), are often seen, after exclusive feeding on Ridge's, or Hard's, or Neave's food, which are also responsible for the opposite more distressing and but little less dangerous condition of emaciation —athrepsia. Fatness and flabbiness in an infant is often combined with rickety bones and with rickety mucous membranes, which take catarrh on the slightest chill or other cause—*e.g.*, atmospheric impurity, toxæmia.

There is often indigestion of *alkali albumen* or casein especially of cow's milk, which, in its hard, dense, cheesy lumps, does not present the largest amount of possible surface to the action of the gastric and other juices. This form of indigestion is frequently a temporary one, lasting a few days. Even with cow's milk it is best not to tax to the utmost the powers of the digestive juices. The curd must be divided by mucilaginous fluids—gelatine, isinglass, mucilage of acacia, or, best of all, barley water (see p. 23).

*Indigestion of fat* is best discovered by an examination of the stools; the globules of oil may be seen in the midst of the other dejecta, and the microscope may detect them easily. Much fat has been found experimentally greatly to prolong gastric digestion, even without causing indigestion.

As in adults, there may be indigestion of *liquids*, especially in children of the second dentition. A simple restriction in the amount of liquid drunk at meals, with the prohibition of

* See "Physiology of Infancy," in "Keating's Cyclopædia," by the Author.

play for half an hour before and an hour after meals, may effect a cure. A free drink may be allowed midway between meals, *i.e.*, about two hours after food.

Now, the real treatment of indigestion will consist in *removing its cause* in any given case.

The cause may lie in the *mother's milk*, the *food utensils*, the *food*, the *stomach*, or the *nervous apparatus*.

The mother's milk may be spoilt by her ill-health; by her eating or drinking unsuitable articles of food, such as rich foods, too much meat or sugars, fruits, and even fats, with highly seasoned dishes; too much beer, or tea or coffee; by indigestion and constipation; fatigue from long walking or mental exercise; nervous prostration from anger, fear, or excitement of any kind, whether due to irritable temper or a sufficient exciting cause. Any error of the above-mentioned order should if possible be corrected. If not, then the suffering infant must seek the breast of a healthy wet-nurse. But the breast should correspond as nearly as possible to the mother's breast, for the milk is richer in albumen and fat the longer the interval after parturition. This percentage of proteids and fats may not be digestible by the particular infant. A very frequent cause of indigestion in infants, especially if cutting teeth, if rickety or otherwise delicate, is the state of the *food utensils*. Everything used about the nursery must be not only clean but aseptic.

The quality of the *food* may be unsuitable, either because the glands and other actions necessary for its digestion are not developed, or if developed, too feeble; the article itself may be altogether indigestible by the particular organism which has ingested it. Tea, coffee, cheese, pastry, beer, wine, spirits, celery, sauces, and condiments, of all kinds excepting salt, but including mustard and pepper, should not be allowed; much drink at meals, much sweets, jam, fruit; much starch, potatoes, rice, barley, tapioca, sago; much

pudding of any kind—should be avoided. They cause indigestion either by giving the gastric and pancreatic juice too much to do, by diluting the gastric juice too largely, or by preventing its proper secretion, possibly also by mechanically interfering with the movements of the stomach, and indirectly by impeding the action of the heart and the circulation. Of course abnormal food is a cause, above all others, of indigestion. Too large a quantity is a cause usually of but fugacious indigestion. Nature is generally equal to this task in infants; vomiting and increased peristalsis may set matters right unless the child be rickety or strumous, when one such indiscretion may entail a gastric and enteric catarrh. The food must not be taken ravenously. A ravenous method of eating signifies a diseased condition of the gastric nervous system, and causes further disease by the indigestion that results from overloading. Food entering the stomach too quickly probably acts as a shock would do, arresting the proper secretion of juice, and causing paralysis of the movements of the stomach; mucus is then poured out instead of juice, and fermentations arise. Lumps of food, swallowed without sufficient comminution—either in the plate or other utensil, or in older children from insufficient mastication—cause indigestion by not presenting the largest possible surface to the action of the juices, and thus allowing the lumps to remain so long undigested that they become acid from fermentation.

Irregularity in the intervals between meals causes indigestion, because Nature, especially in the weakly ones, acts more or less after *habit*. Surprise the stomach either by taking it unawares with food or by depriving it of food longer than usual, the nervous mechanism may be thrown out of gear, and the customary muscular and glandular actions may not occur, or occur imperfectly.

The *stomach* itself may cause indigestion by its functions being disturbed through the agency of the nervous system.

This may happen from sudden expenditure of nerve force, as from temper, fright, anger, or other emotions. Brain disease may disturb any of the functions of digestion. But the cause of all causes in infancy and childhood is catarrh of the gastric mucous membrane, induced doubtless largely by unsuitable diet, as described in the last paragraph, but also produced especially in the debilitated, the rickety and the strumous by catching cold. The commencement of the first and second periods of dentition are also cold-catching epochs. Gastric catarrh is as common as intestinal catarrh, and as catarrh of the respiratory passages. In infants this is especially true, and in them also the whole hypoblastic structures may be involved in universal catarrh.

Again, the lesson of protecting the surface of the chest, belly, thighs, and legs should be inculcated. If these extensive areas be protected from chilling by closely-fitting woollen garments the danger of even rickety infants taking cold will be reduced to a minimum.

The extent of surface often freely exposed during the summer and autumn—when sudden changes of temperature and humidity of atmosphere are most prone to occur—is often very great. Think of the relatively large number of square inches in the surface of the buttocks, belly, thighs, and legs, that go uncovered in summer, remember the great elasticity of the skin, the contractile and expansile power of its vascular supply, and the necessity for protection of this heat-radiating surface will perhaps appear greater.

Sometimes with and sometimes without gastric catarrh the *musculature* of the stomach is disordered; it may not churn the contents sufficiently to bring the juice into intimate contact with all parts and so prevent undue cohesion; or the pylorus may open too rapidly and food be ejected into the duodenum before its time.

The functions of the stomach depend for their healthy

existence not only on local hygiene, as above indicated, but on the maintenance of the health of every other organ of the body, and therefore of the collective health. The infant that does not move its limbs, that does not cry, and struggle, and resist in the exercise of playing, loses general tone, and in this loss the stomach also shares. *Wheel within wheel* is the unconscious motto of the various processes which constitute the organism. A daily evacuation of the bowels promotes digestion, not only by removing all effete and excrementitious matter—thereby preventing deterioration of blood (stercoræmia), with its consequences on the various organs at large, but the evacuation is accompanied by muscular movements, the effects of which on the portal and hepatic circulation cannot be otherwise than beneficial. Sedentary habits in older children may be equally a cause of indigestion as of constipation.

Every contraction of the trunk and limb muscles forces lymph and blood onwards towards the heart and improves the portal and hepatic circulation. The greater the rate of flow of blood into the right auricle from the inferior vena cava, the better will be the flow from the hepatic veins—largely as the result of an aspirating influence exerted by the caval on the hepatic blood. The deep inspirations of exercise increase the flow of venous blood towards the heart by a similar kind of aspirating influence. The above mentioned principle is again illustrated by the improved action of the heart, liver, and intestines which results from exercise not carried to the fatigue point; this improvement must react, for the most part advantageously, on the central and peripheral nervous system by which every organ is kept in harmonious action.

*Bad habits* are easily formed in infants, doubtless owing to the greater relative facility of nerve discharge and to the less resistance to the spread of nerve currents. The habit of

chronic vomiting may be contracted. There may be but little catarrh of the stomach associated with it. It may, like the habit of chronic diarrhœa, with which it may be associated, lead to athrepsia. The dietetic and hygienic treatment is of the first importance. Nervine sedatives may help to break the bad habit. Alkalies and aromatics are very soothing to the stomach. Belladonna, Dover's powder, and bromides may be prescribed with them as more direct depressants of nervous irritability. Some cases are best treated, as if they were epileptic, with a combination of bromide, arsenic and belladonna.

Like other catarrhs, that of the stomach is prone to *recur*, partly because the causes remain, and partly from the establishment of a habit of catarrh. The causes are mostly of a preventable kind, and the habit of recurrence must be combated by tonic measures, such as are recommended to remove the habit of tonsillitis and of nasal catarrh. Forget not that gastric indigestion may largely result from an *inherent* or *congenital inadequacy* of the gastric functions as well as from an acquired insufficiency—the result of disease or removable causes. The stomach may be inadequate, as the liver may be too small. Mostly, there is a reserve of power in each organ; but there may be no reserve in one or many organs. Murchison argued about the liver in this fashion.

*Special treatment.*—The first thing to do for the stomach in any case of indigestion is to empty it. In infants this will hardly be necessary, for vomiting will probably have occurred. The best emetics are sulphate of copper gr. $\frac{1}{2}$ every few minutes, or wine of ipecac. ʒi. every ten minutes—till emesis occurs, or zinc sulphate gr. x., repeated if necessary. Unfortunately, the catarrh may be increased by irritant emetics; and, if possible, vomiting should be excited by fingering the fauces and epiglottis. The emetic turns out all irritant matter, including much glairy mucus, which

may be bile-stained or greenish. To prevent the child's clothes from becoming soiled by the vomit, a towel may be placed under the chin and over the chest and belly. When soiled it must be removed, and replaced by a very dry and clean one. The *bowels* should be cleared with a small dose, ʒss. to ʒi., of castor oil, or 5 to 10 grains of rhubarb and soda, or half-a-dram of compound liquorice powder. These expulsives, having cleared the way, the vomiting and diarrhœa may forthwith cease.

Now, there should be no hurry in further treating the case. The grand principle is to secure rest for the stomach and body, and not to excite fresh catarrh by fresh irritation. If there be a continuance of nausea or retching, teaspoonful doses of iced water or cold filtered water may be tried, and a small mustard (4in. by 4in.) plaster, to act as a counter-irritant to the centre for vomiting as well as to the stomach, may be laid about the epigastrium for ten minutes. The *feeding* should be commenced very cautiously. The cold water may be followed by small doses, given frequently, of thin barley water, mutton broth, beaf tea, veal, or chicken tea, or Mellin's food dissolved in hot water, one dram to the ounce but first cooled. Milk, freely diluted with barley water, or "strippings" and water, equal parts, may be next tried, and thus gradually should the ordinary diet be resumed. Special care must be taken not to overload the stomach with any kind of food. Bread and butter is apt to become lumpy, and should be prohibited. Third day's breadcrumbs is best, and not too much of this. Before meat and vegetables are resumed—supposing the child to be over two years of age—the yolk of an egg, lightly boiled, and a little white fish—soles or whiting without the skins—may be given. The object should be never to give more than the minimum quantity of food that can be digested. This saves the energy both of digestive organs and of the body. If the child be *rickety*

or *scrofulous* special treatment may be required as for those diatheses.

As soon as the vomiting has abated alkalies may be given with bismuth, and, if necessary, opium. The *alkali* is given chiefly to neutralize the excessive acidity associated with excessive secretion of mucus. Also, they and *bismuth* soothe the nerves, and promote the disappearance of the congestion and catarrh. *Opiates* are given when restlessness and vomiting prove obstinate, but they should not be given unless necessary.

℞ Bismuth Trisnit., gr. v.
Sodæ Bicarb., gr. v.
Mucilag. Trag., ♏xv.
Aq. Chlorof., ʒii. t.d.s.

The ordinary prescription that I use is the Mist. Gent. Alk., or the Mist. Rhei et Sodæ should there be a deficiency of bile in the stools. The gentian and the peppermint in these are carminative and antifermentative. A few drops of tincture of nux vomica may be prescribed as a tonic and antifermentative after the acuteness of the gastric attack has subsided. A drop of liquor strichniæ may be given instead. The prescriptions are suitable for a child two years old.

℞ Sodæ or Potass. Bicarb., gr. vi.
Tinct. Nucis Vom., ♏iii.
Inf. Gent. Co. ad., ʒii. t.d.s.

℞ Pulv. Rhei. Opt., gr. iii.
Pulv. Sodæ Bicarb., gr. vi.
Tinct. Zingib., ♏v.
Aq. Menth. Pip., ʒii. t.d.s.

For the CHRONIC INDIGESTION of children not apparently strumous, but only debilitated, the use of emetics is not required, unless the attack should be an acute one, occurring in the course of the chronic complaint. The most

important indications are those mentioned in this chapter in regard to dietary, protection from cold, and the taking of exercise. Chronic vomiting is best stayed by Fowler's solution in drop doses immediately after meals. Drop doses of ipecacuanha wine or nux vomica, fractional doses of calomel may be tried, and a hundredth of a grain of hydrochlorate of apomorphia. The prescriptions just given are also suitable as medicines. The bowels must be kept regular by simple means, including massage along the course of the colon. Ferruginous tonics should be prescribed if there be anæmia; fluid extract of cinchona if not. The best form of iron is two grains of the ammoniocitrate, with five drops of rectified spirit, and two drams of distilled water for a child two years old.*

When indigestion in infants is revealed by agonizing pain and screaming, due to flatulence and colic, *carminatives*, which stimulate the nerves and glands of digestion, as well as render the sensory or afferent nerves less sensitive, are of great value. Chloroform or caraway, or dill, or aniseed water, may be given with an alkali, which also acts by (1) increasing gastric secretion; (2) calming the nerves; (3) and as a preventive of the casein clotting too quickly. This is good treatment. But I object to the administration of alkalies to a healthy stomach. Severe colic may lead to collapse in feeble infants. This is combated by ten drops of brandy, ether, or sal volatile, and by warm baths with mustard, also by wrapping the limbs, as well as the trunk, in cotton wadding. The child must be kept warm. The feet and hands are apt to get cold. They must be rubbed with the dry hand or stimulating liniment, packed in cotton wool, or placed in warm bran bags. Hot bottles may be used near the extremities. A drop or two of laudanum may have to be given.

* This is Vinum Ferri.

**Simple Constipation.**—By simple constipation is meant a confined condition of the bowels with its attendant evils which cannot be set down to any cause detectable by physical examination.

The proximate causes are doubtless deficient secretion and defective peristalsis; but these derangements may be caused in a thousand ways.

*Diet.*—All that has been written in the article on indigestion has a direct bearing on the subject of constipation. The food may be unsuitable. It may be so bland that it fails to stimulate peristaltic action; or it may be too irritating, and set up gastro-intestinal and hepatic disorders, and thus remove or pervert a condition or conditions necessary to the perfect action of the bowels.

It should be remembered that constipation at the outset may be a symptom of derangement of some organ or function, but afterwards may become a further cause of constipation. Constipation may beget constipation. Atony of the muscular coats of the large bowel, with consequent distension and tympanites, may be an important factor. It may be the result of prolonged constipation and the frequent use of large enemas. Dr. Gee and others have written of idiopathic dilatation of the colon. I have seen one case at least in which death finally resulted at the age of ten months, apparently from this cause alone. The whole difficulty dated from birth; the final symptoms were those of intestinal obstruction. At the necropsy nothing was to be found but the enormous distension of the large bowel. Constipation is easily set up in children because of the great length, with twisting and turning, of the sigmoid flexure portion of the bowel.

The diet very often requires alteration, as there exists indigestion of certain kinds of food, so constipation may be caused by members of all classes of foods. Eggs, milk, too

much starch and sugar (rice, sago, tapioca, potatoes, jams, &c.), are sometimes causes. When the food is too bland and too digestible, leaving insufficient residue, fresh vegetables, such as cabbage, turnip, or cauliflower, oatmeal well boiled and softened for breakfast, apple sauce or baked apple, figs and prunes, and compot of fruit—for children a few years of age—may give the necessary relief. Doubtless the glucose some of these articles contain contributes to their laxative effect; and perhaps they have other properties, such as freshness, which also contribute to their useful action. Coffee and tea may cause constipation, especially in older children. Malted rusks or biscuits sometimes do good when the constipation results from imperfect digestion of starch. Whole meal bread may be prescribed, and its beneficial influence is partly attributable to mechanical irritation of the nerves of the intestine.

Constipation may be traced to insufficient drinking. I have cured several cases in growing girls by prescribing the drinking of a quart of fluid in a day.

In many infants under two years of age, the diet is at fault. They may be eating too much starch in the form of bread or the various infants' foods. Sometimes the mother's milk is constipating to the child; well-boiled oatmeal for the mother's breakfast may correct this. For the hand-fed infant a half teaspoonful of manna may be dissolved in the food; it contains a kind of sugar, mannite, on which its relaxing action depends. A teaspoonful of Mellin's food, also from its glucose, may answer as well. Five or ten grains of phosphate of soda dissolved in the milk, and given three times a day, may act as a gentle laxative. Oatmeal water may remove constipation; the meal is boiled for four hours, then strained through muslin; the liquor may be given to the child alone, or with its milk. A small dose of cod-liver oil or salad oil sometimes effects the purpose. In such cases

the mother's milk or the artificial food is deficient in fatty matter. The mother should be told to drink a cup of rich "strippings" or milk half an hour before nursing the baby, or a little cream may be added to the infant's food.

Simple constipation is very frequent in otherwise healthy infants and children. It may depend largely and primarily on deficient nervous activity or inadequacy of the liver and pancreas.

Doubtless regulation of the regimen and exercise with proper clothing will do much to render such inadequacy as little detrimental as possible. In older children, and mostly girls, the abdominal muscles are not used enough, and the portal circulation is sluggish as the result of want of exercise. This would still further increase hepatic and pancreatic insufficiency.

A cold douche every morning (see Catarrh) may effect a change for the better, not only by improving the circulation and general tone, but also by acting as a direct stimulant to the muscular and nervous apparatus of the bowel.

When constantly recurring catarrh of the bowels is the cause of constipation, the flannel or woollen binder to the belly is of the greatest practical importance.

Euonymin, as a direct hepatic stimulant, may be given in grain doses twice or thrice a day, and is frequently serviceable in children over 5 years of age.

*Prolapse of the bowel* may complicate constipation; the bowel prolapsing after every action, whether induced by purgatives or enema. *Ulceration* of the sigmoid flexure and rectum may result from fæcal irritation. The occurrence of prolapse in children old enough to remember is a further cause of constipation, for they will not empty the bowel owing to the pain given them by the prolapse. Again, *screaming* will keep down the prolapse, and so render the submucous tissue more lax, and increase the liability to descent of the bowel.

*Fissures* or *sores* about the anus may also be efficient causes of constipation.

When simple hygiene and prophylaxis fail, it is well to begin with a calomel and scammony or jalap purge; 2 grains of the former and 8 of the compound powder of the latter may be given to a child five years old.

In all attempts never forgot that the object of treatment is to remove a faulty habit and establish firmly a good habit.

Sometimes the rectum has to be emptied by enemata—the child may be placed under the influence of chloroform. A piece of soap or a pencil of paper passed just within the anus will often suffice in little infants. A few drams of warm sweet oil, retained a few hours if possible, makes a good enema; also olive oil, soap and water, about four ounces. A dram of salt to four ounces of water is also effective. If these do not operate, a dram of turpentine or castor oil may be added. The enema must be injected gradually and gently with an elastic bag; the Eguisier may be employed, or, what is perhaps best of all, the irrigator. The *repeated* use of large *enemata* is bad, as it leads to dilatation and atony of the descending colon, which is then not called upon to exercise its normal contractile functions. Large, hard, cindery masses may rarely have to be broken down by irrigation and the use of the fingers, the child being under the influence of chloroform. Once the way is clear, the sigmoid flexure and rectum must be evacuated daily. The importance of establishing the habit of a daily evacuation cannot be overrated. Sometimes irrigation with very cold water is better, and causes more action of the muscular coats. One or two teaspoonfuls of salad oil in the morning with the breakfast, or a fair amount of bacon fat, with a tablespoonful or two of compound decoction of aloes or its equivalent, a quarter of a grain of aloine at night time, has cured a large percentage of cases. The mixture of rhubarb and soda,

three times a day, is more advantageous in cases in which flatulence, acidity, and pale clayey stools exist. Massage and kneading along the course of the colon, together with the inunction of oil, or any liniment, are also efficacious measures. Soap or camphor liniment, with a tenth part of tincture of aloes, is in common use.

If the regulations as to *diet, clothing, and exercise,* with the above instructions, be not sufficient to effect a cure, the next best method of treatment is by *saline purgatives.* The great point, as has been said, is to keep the bowels acting, and this should be done with the least possible use of drugs. Fluid magnesia, Hunyadi Janos water, Eno's fruit salts, or doses of sulphate of magnesia and sulphate of soda, may be given in such quantities as may be necessary to effect at least a daily liquid evacuation. Care should be taken, when such obstinate cases have to be dealt with, that the ingesta are not such as leave much residue, and too much food should not be allowed. Much vegetables, such as greens and peas, should be prohibited, because of their large residue. The theory is this : the constipation is ascribed solely to paralysis or atony of muscle, and a daily liquid evacuation would certainly prevent any distension or further atrophy. The treatment must be so regulated as not to stimulate a paralyzed muscle ; large distending enemata should not therefore be used.

When the bowels have been freely relaxed for a few days tonics, which act on the nerves and muscles, should be prescribed. It is supposed that keeping the bowels empty will lead to recovery of power in the intestinal musculature. Nux vomica, ♏vi., liquor strychniæ (♏iii.), aloes (aloine, gr. $\frac{1}{4}$-$\frac{1}{2}$) and the astringent preparations of iron may be given to a child 10 years old. The aloes might be given as the Decoc. Aloes Co. in tablespoonful doses, or as aloine in half to three-quarter grain doses at night time. A teaspoonful of salad oil may be given in the morning. The other medicines are given

three times a day. The best preparation of iron is the perchloride tincture, in ♏v. doses, or the exsiccated sulphate in 5 gr. doses. The bowels must be kept acting whilst these are prescribed. Systematic exercise, gymnastics, and galvanism are very valuable aids to the treatment.

Galvanism may be employed once or twice a day for ten minutes, preferably at the customary hour of evacuation. The positive pole should be stationed over the sacrum and the negative moved about over the sigmoid flexure.

Tincture of nux vomica, ♏½ for each year of age, in the Mist. Gent. Alk. has proved of service, and tincture of belladonna, ♏v. for a child two years old, sometimes aids this. Infusion or syrup of senna, ʒi. and upwards, may be the best for some children. All these remedies may have to be continued for some time. I can speak strongly of the value of liquid extract of Cascara Sagrada in doses of 15 to 20 minims, or Martindale's pastiles of the same, and I have set bowels right by this remedy when aloes, nux vomica, senna, euonymin, and rhubarb have been tried and failed. Sometimes a pill of aloine and calomel, each in half-grain doses, for a child of five, has succeeded best. I have known a sixth of a grain of podophyllin, three times a day, to succeed when aloes, rhubarb, and senna have failed. The tincture of podophyllin may be given in doses of a few drops. White wheaten gluten suppositories (half-size for children) inserted every evening, or morning and evening, have been recommended.

Pepsin in five or six grain doses with the meals, three times a day, certainly relieves some cases of constipation, probably by improving digestion and rectifying the intestinal conditions.

Spurious diarrhœa, consisting in the passage of blood and slime, often discoloured by fæces, may be due to the presence of impacted matter in the sigmoid flexure.

Prescription for an infant of six months :—

℞ Magnesiæ Carbonat. } aa. ʒii.
Mannæ Opt. }
Syrupi Sennæ, ʒii.
Aq. Menth. Pip., ad ℥iii.

ʒi. two or three times a day, as may be necessary.

With clayey, hard stools, sallow skin, and loaded tongue, for an infant of one year :—

℞ Resinæ podophylli, gr. ¼.
Spirit. Vini Rect., ♏xx.
Aq. Menth. Pip., ℥iss. ʒi. twice or thrice a day.

A sudden change in the diet (such as may be effected by feeding on meat and broths for a few days) often acts in such a manner as to change the nature of the bowels. At least such a temporary alteration has been followed by a regular action of the bowels on the resumption of an ordinary diet. This principle may be applied also to diarrhœa and to some nervous disorders.

**The treatment of simple diarrhœa.**—Whether diarrhœa or constipation occurs must be looked upon as a matter of accident. Perhaps it depends on the state of the muscular coat of the large bowel. If this is in an atonic state constipation results. The *causes* of both symptoms and of indigestion are not very different. Bad feeding and catching cold may cause one or the other (see article on Indigestion). *Rickety* diarrhœa is a simple diarrhœa caused by bad feeding and chills. A pair of flannel drawers or a combination garment should protect the surface of the abdomen from chill. In simple diarrhœa of chronic kind, a waistcoat of flannel tightly applied to the abdomen, or the familiar flannel binder with fastenings behind, reaching well up the ribs and down to the hips, is very serviceable. The flannel binder is apt to shift upwards; a perineal band passing under the crutch is a useful contrivance. Dentition diarrhœa is well treated by

the same means. Defects in the mother's milk—*e.g.*, when it contains colostrum after the first week—may be a cause. The reaction of the alimentary tract should be everywhere alkaline except in the stomach. Acidity in the mouth and fauces favours the development of thrush, and acidity promotes unhealthy states of the mucous membrane of the intestines. Hence the great value of alkaline remedies in childhood. Many cases of simple diarrhœa, whether the motions be watery or slimy, or bloody, with fragments like "meat washings," may be treated successfully with the Mist. Olei Ricini.* But attention to the *diet* is absolutely necessary. It should not contain pure cow's milk, nor much starch, or fruit, or sweets, for these articles cause acidity of the intestinal contents, doubtless because they undergo fermentations. If the diarrhœa be known to be caused by the ingestion of some obvious irritant, any purgative that quickly acts may relieve the patient at the cost of a little strength. A teaspoonful of castor oil is the most useful for this purpose, but sometimes the rhubarb with soda may be preferred—of each four or five grains made into a paste with glycerine, or given in pilules or capsules—if the stools have but little colour. Fluid magnesia is an elegant and useful preparation. Actual *astringents* and *paralyzers* of the muscular coat should not be used if their use can be avoided. Naphthalin in grain doses frequently repeated and combined with a diabetic diet is a valuable mode of treating any form of diarrhœa—even when the stools are not specially offensive.

In the first few months of infancy the simple form of diarrhœa is very commonly due to sourness of the food or to the presence of large curds in the intestines. Barley water tends to prevent the formation of these lumps, doubtless because of its gelatinous nature, for isinglass will effect the same purpose. Infants at the breast should not be fed too fre-

* For formula, see Treatment of Rickets.

quently nor too much at one time. The duration of each meal should be shortened. Attention should be given to the cleanliness of the food and food utensils, as advised in the general chapter on feeding. It is thought that dentition and other simple diarrhœas should not be checked too rapidly, lest cerebral symptoms ensue. I believe that cerebral symptoms may supervene whether the diarrhœa be checked or not ; probably the diarrhœa and the cerebral symptoms are directed by the same causes. General hygiene, including fresh air, bathing and clothing, is very necessary. The gums may be examined, but rarely require lancing. A mixture containing three grains of bismuth trisnitrate, and three also of bicarbonate of soda, with five drops of chloric ether or sal volatile or spt. chloroform, may be administered in two teaspoonfuls of chloroform or peppermint water three times a day. And this may be used when the Mist. Ol. Ric. has not done much good, or sometimes, if the stools be not offensive and only watery, it may be employed first. Of *chalk and catechu* for this diarrhœa I know nothing, but others recommend it. Tincture of *opium* may be used in half-drop or drop doses if the stools are numerous and the quantity passed not great, or if there be any of that explosive action which sometimes constitutes a feature of infantile diarrhœa. But this explosive diarrhœa may be treated with the same remedies that are used to check epilepsy. A tonic of steel wine or cinchona may round off the treatment.

*Lienteric diarrhœa*, in which the food is ejected undigested, and where every act of ingestion causes rapid peristaltic action, is best treated with bromide of potassium in two grain doses every hour, twelve times a day. This may not succeed, then the liquor arsenicalis ♏ii. and vinum ferri ʒii. may be given three times a day, for a boy of six years, which is the commonest age for this diarrhœa. Liquor strychniæ ♏ii., or the tincture of nux vomica in the Mist. Gent. Alk., is

sometimes more useful. Sometimes the arsenic and strychnia may be given together with advantage, one drop of Fowler's solution and two drops of the tincture of nux vomica, three times a day.

**Athrepsia—Food Atrophy—Marasmus.**—This wasting of body without tuberculosis, or obvious rickets, is the result of chronic inflammatory disease of the stomach and intestines, due to the constant ingestion of indigestible food. The vitality, or want of it, is an element in the production of the atrophy; but even the strongest infant, endowed with high vitality, would probably be unable to prevent itself from becoming marasmic if sufficient improper food were supplied. As the name food atrophy implies, the chief cause of the disease is bad feeding. But, besides this dominant cause, bad hygiene of any sort, by lowering the strength and the powers of digestion, acts as a more or less direct promoter of the atrophy. Amongst hygienic defects none ranks higher in the possession of baneful influence than a cold, damp, and impure atmosphere, with sudden variations of temperature. This induces frequent catarrhs of the stomach, intestines, and respiratory passages.

The *causes* of athrepsia are the same as those of indigestion, constipation, and diarrhœa already considered, so that it is needless to repeat them. Marasmus is the outcome of their persistent action. Athrepsia is easy of recognition. The wasting is evident after indigestion has lasted but a few days, and this, whether the infant be at the breast or hand-fed. In older children, who may also suffer from food atrophy, the wasting, though less rapid, is soon noticeable. Screaming and crying are most striking symptoms. I believe that children suffering from tubercular atrophy never scream and cry with the violence of simple marasmic ones. The screaming may be found to be due to violent griping from excessive peristaltic action. Doubtless the exhaustion and

wasting are promoted by this screaming, which prevents sleep at night. There is not only loss of all fat and wasting of muscle, liver, and other viscera, but the blood grows thinner and paler, the number of red disks and percentage of hæmoglobin becomes greatly reduced. Atrophy, anæmia, and asthenia go hand in hand. The appetite and bowels may be as variable as in indigestion. Rashes of red gum about the buttocks and other parts, erythemata and urticaria may be seen, and the mouth may be inflamed with simple stomatitis, or aphthæ and thrush may supervene. There is no fever, the temperature tends to fall, and especially in cases that are about to prove fatal. Catarrhal pneumonia supervening on collapse of the lung may or may not raise the temperature. In the final stage of emaciation the skin closely fits the bones everywhere, giving a ghastly aspect to the face, especially when the facial muscles contract and the nasolabial folds stand out. In this condition œdema especially of the feet is not uncommon, and purpura may be seen.

The *diagnosis* is as a rule easy. Syphilis and tubercle may cause atrophy, and may be associated with the food atrophy; indeed, often are in out-patient practice. But there will always be signs of congenital syphilis. And with tubercle the lungs are not likely to escape, the cry is feebler, the temperature usually elevated. In children about two years of age doubt may exist for a time, especially when, though good feeding and hygiene improve the patient for a time, relapses occur. I have seen many cases, and made necropsies of not a few children of this age, in which it was impossible to be sure during life whether tubercle was present or not. There may be bronchitis in simple marasmus. A case of wasting and indigestion that goes on for many months is much more likely to be simple than tubercular marasmus. On the other hand, there can be no sort of doubt that tubercles and tubercular diseases do become obsolete in children even more frequently than in adults.

Night sweats are perhaps less frequent in marasmus than in tubercular diseases, but they are often absent in both conditions. Indeed, the skin may be dry, harsh, and rasplike in either affection.

For the *treatment of athrepsia* the reader should consult the sections on the principles and practice of feeding infants and children, and the articles on indigestion, constipation, and the various forms of diarrhœa. If the case is taken in time, treatment is most hopeful. Simple and pure hygienic measures are alone necessary. There is a great necessity for graduation in the administration of diet, especially when the atrophy is partly dependent on actual starvation. The thirst, vomiting, diarrhœa, constipation, and screaming may disappear like magic when the bowels and the stomach are emptied of their irritants and a proper diet is substituted. But little hope can be entertained of cases in which the emaciation has gone on to the development of a condition of "spurious hydrocephalus," with coma and convulsions, thrush in the mouth, and a raw bottom. Even these may be rallied at least for a time by the administration of stimulants. Short of this final stage no case should be regarded as hopeless.

Food atrophy may affect infants at the breast, but the directions given with regard to the mother as a nurse, and those for the getting of a wet-nurse, etc., may suffice to stay the wasting.

The reason why these cases of bad feeding, under the age of two years, do not, as a rule, develop craniotabes, bossy skulls, and other signs of rickets is not very apparent; perhaps the pace is too great, for rickets requires time to develop its osseous peculiarities; food atrophy is rather rapid starvation than chronic bad feeding; it may be that the vomiting and diarrhœa by emptying the intestinal canal of acid contents prevent the diminished alkalescence of the blood on which rickets and perhaps scurvy are dependent.

## CHAPTER IV.

### SECTION OF GENERAL DIATHETIC DISEASES.

**Lymphatic tissues in childhood.**—The great activities of the lymphatic tissues in infancy are doubtless largely answerable for the rapid spread of disease in infants and children. Spread is most rapid along tissues of similar embryological evolution : mucous membranes, nerves and skin, lymphatics and vessels being fair respective representatives of hypoblast, epiblast, and mesoblast. Peripheral mucous or cutaneous irritation, causes greater glandular enlargement the younger and the more "scrofulous," the child. Rickets promotes nervous diseases, scrofula promotes diseases of the mesoblast, especially of the indifferent tissues, *e.g.*, lymphoid tissue. Abscesses are more easily excited in infants than adults. Adolescence is attended with a striking subsidence of lymphatic hyperplasia which often proves of therapeutic interest. The rise and progress of disease dependent on lymphatic activity form a frequent and interesting study in children. A not uncommon sequence of events may be thus given :—Catarrh of mucous membrane, corresponding glandular enlargement, possible subsidence of catarrh, but continuance of glandular hypertrophy and sequent caseation of the same, wedging of the caseous glands in lung tissue, suppuration and ulceration of them into a bronchus resulting in *Bronchial phthsis*, whose future course may be variable and fully as eventful as its etiology. The story is somewhat similar in the mesentery and elsewhere. The sympathy or contagium vivum, or whatever it is that causes other adenoid structures to overgrow and caseate when one has done so is

also a striking feature. The spread of morbid and healthy action is not only easier, but more marked in infants and children as compared with adults.

## SCROFULOSIS—LOCAL TUBERCULOSIS.

The well-known characters of scrofulous lesions of the skin, mucous membranes, lymphatics, and bones, together with their wide prevalence, render it unnecessary that in a work on applied therapeutics addressed to the practitioner the author should be at the pains of describing such common lesions. I shall, therefore, neither meddle with their causes, symptoms or diagnosis, more than is necessary for the purpose in view, which is simply to indicate the lines of treatment found most useful, and to give a satisfactory sketch of other treatment in vogue.

**Treatment—Hygienic and Prophylactic.**—The aim of treatment is to "alter the constitution," or to restore the scrofulous working protoplasm to normal modes of action. In what chemical or physical way scrofulous molecules of protoplasm differ from normal ones is not known. The scrofulous protoplasm is prone to develop chronic lesions from the slightest cause. Permission cannot be given such organisms to deviate from a life of routine in which the pleasures and pains should be confined within the narrow limits of their powers. "Early to bed, late to rise," implying long sleep, is beneficial, with this provision, that the air consumed in the bed-chamber be fresh and pure.

The influence of *dampness*, *coldness*, and *impurity* of *atmosphere* is greatest in scrofulous organisms. A well-drained house, and a dry porous soil are absolutely necessary. Dry cold is not so injurious, and may be made beneficial, but a combination of frigidity and humidity is a sure depressor of vitality.

Strict attention should be given to the *habits* of life. A few

hours' work in a light and airy room, and perhaps not more than an hour at a time, with as much out-door life as possible in fine bright weather are of great importance. The foot covering should be sufficient to prevent the soles of the feet—these nervously sensitive external kidneys—from becoming cold and wet; a wet play-ground or soil should be avoided. Goloshes or rubber boots are useful.

*Climatology.*—A *sea voyage* is very valuable provided the weather be fair and the whole day spent on deck. It is most necessary to attend to the ventilation of the saloon and berth. Direct observations have shown to what an alarming extent the living-rooms may be contaminated by organic emanations, including bacteria. A high barometric pressure appears to have but little influence as a therapeutic agent in the treatment of scrofula. Or rather we know but little about it. Some children seem miserable at the sea level, and happier when at a higher elevation. Mountain air, with its bright, germless atmosphere is undoubtedly valuable; resorts where over-crowding and ill-ventilation obtain should not be chosen. The sea coast, with dry air, at a high elevation and well-drained, is salubrious if similar precautions be taken about the impure air indoors. Nevertheless a dry inland air and a farm-life suit some cases much better.

A bracing sea air may be obtained along the east coast—Cromer, Southend, Folkestone, Broadstairs, Margate; a relaxing and warm climate at Bournemouth, Penzance, Torquay, Hastings, and Brighton in summer; a medium climate is met with at the above in winter time. The hill outside old Hastings is bracing even in summer. Ventnor, Undercliff, and the Riviera are also valuable resorts. In the selection of a suitable climate, many factors have to be taken into account. A feeble circulation sometimes precludes the recommendation of very cold climates. But cold mountain air may greatly improve the circulation, possibly on account of the lowered

atmospheric pressure. Nervousness or neurotic temperaments are sometimes worse, sometimes better at a great elevation. The assumed advantages of climate are: the avoidance of sudden variations in temperature, and therefore a lessened demand on the general strength; the obtaining of fresh air, free from septic and other germs, of sunshine which promotes nutrition; protection from depressing cold east winds and continued unfavourable weather; pleasant surroundings, which also promote mental health and bodily nutrition.

At page 7 is given the kind of clothing most suitable; this includes high-necked dresses, long sleeves and drawers, &c.

*Exercise* is very valuable, but must not be carried to the fatigue point, or to the point of causing palpitation. *Massage* may be useful when exercise is not possible. *Inunctions* may be combined with massage. Neat's-foot oil or olive oil are more cleanly and less disagreeable than cod-liver oil. The oils are partly absorbed by the lymphatics, and may thus act as food. *Friction* with the dry hand or flesh brush increases the lymphatic circulation. Massage removes waste products from the muscles, aids the circulation, and increases the action of the skin, as is indicated by the hyperæmia. I do not think inunction of much value; the fat rather tends to block the sweat glands unless careful washing and cleaning be practised.

*Gymnastics* are very beneficial in those scrofulous children in whom the circulation is feeble, the hands and feet cold, bluish and damp. For the mode of action of these agencies the reader should consult page 15. The doctor should pay attention to every system of the body. The health of the lungs is promoted by the avoidance of vital, chemical and mechanical impurities in the atmosphere; large cities and towns are therefore injurious. Stagnant damp air favours decomposition, sepsis and the formation of foul organic acids,

and promotes also the development of bacteria; therefore valleys and low-lying stations should be avoided. Sunlight, by its action through the skin and retina, stimulates nutrition, as has been physiologically proved in animals. Places with a short daily duration of sunlight are not generally the most eligible for the scrofulous. Gymnastics tend to expand the chest and enlarge the lungs, which then act more efficiently as purifiers of the blood. That tendency to apical condensation, ever present in small chests, is likewise averted by exercise. Dusty rooms should be avoided as likely to cause pulmonary irritation and phthisis. The inspiration of mechanical and organized particles may establish or increase pulmonary catarrh.

Houses built on a clay soil should not be chosen for residence; such are less objectionable, however, if the soil has been extensively and completely drained. Dampness indubitably predisposes to, and perhaps excites the development of, phthisis. The muscular, nervous and circulatory systems may be improved by gymnastics and massage. A healthy action of the skin and kidneys may be promoted by the same means, for the blood pressure is raised, the veins emptied and the arteries filled by these agencies. The combination of neurasthenia with scrofula is more difficult of treatment than either defect alone; many measures efficacious for scrofula cannot be carried out owing to the nervous debility.

*Balneology and hydrotherapy.*—The body must be soaped at least once a day, and the skin kept perfectly clean.

Cold douches (see the chapter on the Treatment of Catarrh) are good tonics. Sea-bathing is suitable in some cases, and has a more powerful, bracing and tonic effect than fresh-water bathing. Certain foreign and home spas are in high repute for the removal of the scrofulous diathesis. The hot baths of Bath are certainly, with

proper precautions, useful in older children. Chalybeate waters are drunk for the anæmic states of scrofula. Purging saline waters, especially of Carlsbad and Friedrichshall, are decidedly beneficial in securing the daily evacuation of the bowels, and in promoting the action of the liver and intestinal glands; they thus indirectly cause a general good effect. A wineglassful may be taken by children of seven every morning before breakfast. Sulphuretted waters of Cheltenham and Moffat have also been recommended; also the iodobromated waters of Wiesbaden, Kreuznach, Baden-Baden on the Continent and Woodhall in England.

The bowels must be evacuated adequately once a day. Faulty habits and atony of the bowel are the chief causes of constipation in scrofula. In these cases the tone of the whole body is below par, the stomach dilated, the tongue flabby, the pulse dicrotous, the pupil dilated, the stools poorly coloured and the spirits low. Massage of the abdomen is valuable; the masseur's hands should stroke the belly and squeeze the deep parts always in the direction of the peristalsis of the colon.

Strychnia and aloes are the most generally useful drugs, if any should be required. (See Constipation.) Large enemata and powerful purgation should be avoided, because all catarrhs should be prevented in the scrofulous.

The food must be nourishing and digestible. The mother if consumptive should not suckle her offspring. Artificial feeding is decidedly deleterious; therefore a healthy wet nurse should be procured wherever possible. Underdone or raw meat, new-laid eggs, cream and fresh cow's milk are good. Carbohydrates should be given in spare quantities: One mealy mashed potato or half the head of cauliflower a day, made into a purée with milk; only a little well-boiled, thoroughly smoothed rice, sago, tapioca. Boiled greens, spinach, cabbages, cauliflower, broccoli, may be taken in

strict moderation. Sweets, jams, candies, preserves, pastry, nuts, cheeses, are liable to prolong digestion, increase decomposition and develop catarrh; only the smallest doses of these should be permitted. The appetite is most variable even in the same child; a ravenous appetite or positive anorexia, may sometimes be relieved by a little wine with the meals, sound claret ℥i. or port ℥ss., or ʒii. of brandy in the water or milk; or this ten minutes before meals for a child of seven years:—

℞ Sodæ Bicarb., gr. vii.
Syrupi Limonis, ♏xx.
Inf. Calumbæ, ʒii. t.d.s.

I have tried a diabetic diet for a few weeks in a few cases of scrofula with but little advantage; further trial is desirable.

**Reputed specifics.**—*Cod-liver oil* must be given with much thought and great discretion. The physician is armed with numerous weapons; he has absolute control over the admission of ingesta. In my experience there is no type or constitution which necessarily contra-indicates cod-liver oil, administered in some form or in some way. I cannot endorse the views of those who draw distinctions between fair and dark, thin and fat children, in relation to the taking of cod-liver oil. Tried, if necessary, with minute attention to details most scrofulous children will take it for months together. Most children of the poor enjoy cod-liver oil; most children of the rich and nearly all the children of neurotic families raise objections to taking the oil, and frequently raise the oil after it has been taken; the "risings" or eructations are sometimes complained of in terms implying the greatest disgust. There are a *few* children who seem to be unable to derive benefit, no matter what the form or method of administration.

*Methods.*—The use of gelatine capsules to conceal the taste ought to be more extended. The dose should be small to start with. Half-a-teaspoonful is a good dose, twice or thrice a day; it may be increased or even further diminished according to circumstances. The stools should be examined to see that much oil is not passed undigested. It is not the quantity ingested, but the amount assimilated which does good.

*Times of administration.*—The oil should be given an hour and a half after meals. The object should be to introduce the oil into the duodenum when the duodenal juices are in powerful action. Experiments appear to prove that fats delay gastric digestion. Strictly speaking, the oil should be ingested in time to pass into the duodenum as the last part of the chyme is disappearing from the stomach. This moment most certainly varies in different children. In some of the scrofulous, gastric digestion goes on gaily, and the oil may be given with the meals without weakening the work of the stomach. However, a few simple experiments in each individual will usually quickly enable the therapeutist to find the time that is most suitable for the administration of the oil. It is easy to understand that a dose of dilute hydrochloric acid with the oil may ensure its more efficient emulsionization and saponification, because the acid given at the end of gastric digestion would serve as a stimulant to the secretions that flow into the duodenum. Occasionally the oil is better borne, and better digested, if given in a larger dose only once a day, after the mid-day meal. Rarely it is taken best on going to bed, or after breakfast. The oil may be taken, digested and assimilated best if given with iron wine, glycerine, calumba or an alkali. An experiment will have to be made in every case of failure with the simple oil alone.

The following are a few prescriptions which may be useful if the oil cannot be taken alone :—

℞ Tinct. of Calumb. ♏v.
Cod-liver Oil, ʒss.
Lime Water, ʒss. t.d.s.

℞ Carbonate of Potash, gr. ii.
Cod-liver Oil, ʒss.
Aq. ʒss.

℞ Cod-liver Oil, ♏xx.
Steel Wine, ♏xx.
Glycerine, ♏xx. t.d.s.

℞ Cod-liver Oil, ♏xx.
Lime Water, ♏xx.
Glycerine, ʒxx. t.d.s.

Scott's emulsion and one made by Mellin are very serviceable.

*Anæmia* should be treated with iron in some form. The syrup of the iodide, ♏x. to begin with, is useful when there are no lesions, but still more if there be a chronic ozena.

*Iodides* are reputed specifics ; they promote metabolism or tissue change ; with hygienic surroundings, liberal diet, and tonics, they may help to bring the scrofulous protoplasm back to normal modes of action. The syrup of the iodide should be mixed with water at the time of being taken ; it is best not to keep the iodide long diluted with water, because deleterious chemical changes are said to occur. The syrup may cause nausea and biliousness.

Iodide of potassium or sodium may be given in 2 grain doses, increased cautiously. Tartrate of iron, gr. iii., is often prescribed with these. Glycerine ♏xxx., or syrup, plain or of tolu ʒss., and water to ʒii., makes a palatable preparation. *Chloride of calcium*, gr. v.-x., in milk after food, four times a day, is specially recommended for scrofulous enlargement of glands. *Sulphides*, especially of calcium, are prescribed

for all scrofulous lesions, particularly subcutaneous indurations or tubercles. Ringer states that they hasten elimination of pus and cheesy matter. I prefer surgical treatment for these local lesions. Sulphides are given in fractional doses, gr. $\frac{1}{8}$ or $\frac{1}{6}$ three or four times a day; or gr. $\frac{1}{20}$ or $\frac{1}{10}$ every hour or two. Repeated large doses may cause anæmia. The sulphides are said to improve the general health; other drugs are not employed in conjunction with them. A teaspoonful hourly of a solution of one grain in half-a-pint of water is recommended by Ringer. Pilules are also possible modes of administration. Dr. C. West advised constitutional treatment only for the subcutaneous lesions, and rest by means of splints for the hands and fingers. The local rest is decidedly good.

*Iodine* may be prescribed in the form of tincture or solution; a few minims of either further diluted in water and given twice or thrice a day after meals. Lugol's solution is preferred by some (K I gr. xxx., Iodine gr. xx., Aq. ℥i.) 2 or 3 minims three times a day. These appear to have no special advantage over oil and arsenic. Iodide of starch in contact with the corporeal juices, liberates free iodine; two drops of the tincture are dropped on starch and given in syrup; I cannot perceive any advantage in this method. *Phosphate* of lime is given in two-grain doses, alone or with one grain of iron. Small doses of Donovan's solution, Liq. Hyd. and Ars. Iodidi, are also recommended.

*Mercury* should not be used. Some have claimed that small doses of bichloride or biniodide have benefited obstinate cases.

Parrish's chemical food, or Easton's syrup, which contains strychnia, may be also used. The syrups sometimes disagree. Hypophosphites of lime and soda probably become phosphates in the stomach. As stimulants to the liver and other organs of digestion, these preparations are of considerable value. *Arsenic* in drop doses after food is certainly valuable in chronic glandular enlargements. It is the most valuable alterative next to cod-liver oil, and may be prescribed with vinum ferri citratis.

**Surgical Treatment.**—I advocate surgery extensively for local scrofulous lesions. Chronic glands near the surface, and easily removable by the aseptic surgeon, ought to be neatly dissected out. Induration of the skin over them, or adhesions

to the surrounding tissues, ulceration, discharge or abscess should be regarded as indications rendering the surgical removal all the more necessary. The friendly knife removes all tubercular matter, and the wound heals comparatively rapidly with a sound cicatrix under the benign antiseptic influence of iodoform, absorbent antiseptic wool and *lasting* dressings. Ugly scrofulous scars often conceal caseo-fibroid tissue or gland which may form the starting-point of fresh ulceration at any time. Neat removal by the careful aseptic surgeon should be advocated. Subcutaneous tubercles, or abscesses not glandular, should be treated in the same way. Accessible tubercular ulceration, and infiltration of mucous membranes, should also be cut away. The galvano-cautery should not as a rule be used.

**Local treatment.—Hygienic.**—All scrofulous lesions should, as far as possible, be protected from injury, from movement, from cold, damp and from the atmosphere. I believe that free exposure to these agencies increases lymphoid hyperplasia. Air favours septicity and should be rigorously excluded from an open sore.

Large glands in the *neck* should be protected by a woollen neck wrap, or layer of cotton wool and band of silk, in order to keep the parts constantly at a uniform temperature and to prevent chilling of surface. Pharyngo-laryngeal catarrh, which increases adenoid hyperplasia of corresponding glands, may be prevented by this means. An apparatus may also be worn to prevent movement of the neck.

*Mucous membranes and skin, e.g.*, the scrofulous thick upper lip, the seats of superficial ulceration and scabs not needing surgery, should be treated thus :—All scabs and crusts should be removed as soon as formed with carbolic oil (1 in 40). Water should never be used to clean the sores. When perfectly clean the raw surface should receive the antiseptic ointment or powder, lotion and dressing. Dry and lasting

dressings are best, as securing rest and absence of irritation. Salicylic, sal alembroth, and iodoform wools are invaluable.

**Antiseptics.**—Finely powdered iodoform may be blown on to the sore from an insufflator. Some prefer finely powdered boric acid. A dressing with sal alembroth, or a weak lotion of corrosive sublimate (1 in 1,000), is preferred by some. All these are good, but I always use iodoform. Possibly inodorous iodol may replace iodoform.

**Scrofulous ozæna** should be treated as far as possible on the same principles as cutaneous sores. Nasal douches or syringings are of much service. Corrosive sublimate, gr. x. to Oi., warm, twice a day, is valuable for this purpose. Nasal douches and syringings are often difficult of application. Some of the lotion may be swallowed, hence the mercurial should be used with caution.

The syphon arrangement is not necessary, as Maw's irrigator is cheap and effective. The great object of all local applications should be to obtain perfect cleanliness by the removal of all scabs and by the employment of antiseptics; the latter act also as curative agents.

*Insufflations* are preferred by some, but they are apt to cake and form crusts. Finely-pulverized iodoform from a puff or insufflator twice a day, after douching or alone, is an excellent insufflation; but the nasal cavities must be cleared daily, either by forcibly blowing the nose or by douches and syringings.

*Ointments* are most useful in young children. Iodoform ʒi., eucalyptol ʒi., geoline or vaseline ℥i., make a good ointment, and may be introduced on a charged camel's-hair brush, placed as far up as possible, after the scabs and crusts have been removed by soaking them in oil or lard, and picking them off with forceps or wiping them away with lint. The mother should receive actual instruction. Many dilute

mercurial ointments are employed in the same way, *e.g.*, white precipitate and citrine 1 part to 8 of lard.

The *general* and *tonic* treatment is of the utmost importance. A sea voyage, with the precautions already alluded to, may do more to remove ozæna than any quantity of tonics; but local applications are not to be dispensed with even on the voyage.

The cure of ozæna is indeed difficult. Even the stench may defy treatment. There are many antiseptic lotions, so that it seldom happens that the stench is altogether irremediable. A ʒi. to Oi. of Condy's fluid, or common salt and water, are good douches for children some years old; they should be warm, say 80° to 90°. Children may snuff up this fluid out of the palm of the hand when they repel the douche. The smell of iodoform is preferable to that of ozæna. Iodoform, indeed, has healing and antiseptic properties for ozæna. Iodol may be tried.

**In Eczema tarsi** the eyelashes should be removed, the pustules emptied, and the lids bathed with biborate of soda (gr. x. to ℥i.) of warm water. The bathing should be done repeatedly. The margins of the lids should be smeared every night with dilute nitrate of mercury ointment, 1 in 4 or 1 in 8. The stick of nitrate of silver may be used occasionally, and may promote healing.

*Strumous ophthalmia* needs careful, constant cleansing with the dilute boric lotion. A shade for the eye; atropine lotion to ease the pain and photophobia and some dilute yellow oxide ointment, with atropia, may promote healing.

**Vaginitis.**—Syringing with hot lotions and hip baths are best in the acute stage; they should be used at least twice a day to relieve dysuria and distress; they are cleansing and soothing, and act as counter-irritants to the inflammation. The lotions should be employed as hot as can be comfortably borne. Alum, gr. x. to ℥i.; carbolic lotion, 1 in 40;

fresh infusion of belladonna; tincture of aconite, ℥i. to ℥i. water; chloral, gr. x. to ℥i., are all good.

*After the acute stage*, powders, ointment, and lotions are employed; but the dry method is by far the most efficacious; the vagina and vulva should be mopped thoroughly dry and then packed with iodoform and starch, in fine powder; finally a pledget of lint or a dab of antiseptic wool should be placed between the vulva. This treatment should be repeated night and morning. Pledgets of boracic lint, salicylic wool, iodoform wool, well-rung-out lint or wool soaked in 1 in 20 carbolic. These are absorbent and antiseptic. They should be renewed as often as necessary, but they should not replace the other measures; they may be easily placed between the labia, and are easily retained. In irritative eczema from worms, these antiseptic absorbents are simply invaluable.

One part of calomel and three of starch, or this:—powdered lycopodium 30 grains, subnitrate of bismuth 10 grains, belladonna root powder one grain—has been recommended. Any dilute mercurial ointment is good. Some use complex ointments, thus:

Glycerole of Starch, gr. 25.
Bromide of Potassium, gr. i.
Subnitrate of Bismuth, gr. i.
Calomel, gr. $\frac{2}{5}$.
Ext. of Belladonna, gr. $\frac{1}{5}$.

These are applied by means of a camel's-hair brush. I do not recommend the composite ointment, and have the greatest faith in iodoform insufflation, or ointment made up with a dram each of eucalyptol and iodoform to an ounce of geoline or lard.

A lotion of weak carbolic acid, gr. v. to ℥i., or, better, corrosive sublimate, gr. x. to Oi., of simple or lime water, may, if necessary, be syringed into the vagina by means of a fine catheter. Sulphate of zinc gr. ii. to ℥i., liq. plumbi dil.; nitrate of silver, gr. v. to ℥i., are also used. Teething, worms, and gastro-enteric derangements should receive attention. A discharge of blood may take place from the vagina much to the alarm of the parent.

Copaiva has been prescribed to relieve the dysuria and distress; it can

seldom be necessary. ℞ Bals. Copaibæ, ♏v.; Liq. Potassæ, ♏v.; Spt. Æth. Nit., ♏x.; Aq. Camph., 3ii., for a child four years old. It would be better given in a capsule.

**Protracted Otorrhœa** is best treated by the dry method; mops of salicylic wool being used to wipe away all discharge. Perfect cleanliness by this method or by syringing with lotions of antiseptic nature is the first thing. Surgical treatment should not be delayed. These cases should be cured, and that soon.

**Counter-irritations and absorbents to glands and joints.**—The skin of children is a tender structure, and must not be made sore. The liniment of *iodine* may be too strong, and the tincture is generally preferred; they are *valueless*. The oleate of mercury (5 per cent.) is a cleanly preparation, and may be painted on. *Blistering* fluid should not be used, though some advocate a frequent application, some have advised blistering, not over, but at some little distance from the gland; the Ung. iodide of potassium is not dirty, but probably the friction does most good. The local applications should not be used when active inflammation is present; sometimes an indolent gland may take on a sloughy action under the influence of vigorous external and internal administration of iodine. Counter-irritation, on the whole, must be condemned. The large glands owe their existence partly to local irritation. Can counter-irritation remove them, then? Gentle friction may possibly exert a beneficial absorbent action.

## LARDACEOUS DISEASE.

Thanks to modern surgery, lardaceous, waxy, or amyloid disease is rarer now than it used to be. Chronic suppurations from bone, empyema and lung disease (dilated bronchi and suppurating tubercle), are its commonest causes. The syphilitic cachexia may be attended with

a fair amount of lardaceous change in the viscera. The chief organs affected are the liver, spleen, kidneys, lymphatic glands and mucous coat of stomach and intestines. The change begins in and flourishes most in the tissues of mesoblastic origin. Boys above the age of five yield the largest number of cases. The visceral enlargement of liver and spleen are known as painless, hard, smooth tumours which can be felt below the margin of the ribs; or percussed as dulness, extending upwards beyond the usual boundaries of these organs. Anæmia always goes with lardaceous disease. Albuminuria may signify renal change, but may also imply inadequacy of the liver to transform the right amount of albumen. The **treatment** of this disease is that of the disease with which it is associated. General *hygienic* measures are of vast importance. The patient should breathe as much fresh sea air as possible. Cold douches (see Nasal Catarrh), massage, and exercise (see p. 10) should all be used systematically, wherever possible. Alkalis are also highly praised. The chloride of ammonium, 5 grains, is prescribed with a bitter stomachic, either of infusion of calumba or compd. infusion of gentian ʒii. for a child seven years old. Cod-liver oil and steel wine, managed as recommended for scrofula, often effect wonders. So also does the syrup of the iodide of iron; or three grain doses of iodide of sodium given with ten drops each of spirits of chloroform and glycerine in ʒii. of compound infusion of gentian for a child five years old. The iodine preparations are most valuable when there is evidence of syphilis.

The diet must be regulated in harmony with the powers of the stomach, pancreas and other digestive glands, and with due regard to the state of the bowels. The indications will be found under the head of scrofula, empyema, indigestion and diarrhœa. A little high-class port wine, ℥ss. with the meals, is often of conspicuous value. Claret ℥i. may answer

better. It will be gathered that this disease in children is by no means an incurable one.

Dropsy should be treated with iron, for it is largely dependent on anæmia. Tincture of the perchloride ♏v., or exsiccated sulphate of iron gr. ii., may be given with twenty drops of glycerine in peppermint water. Cardiac tonics, digitalis, squills, strophanthus and the like increase the amount of albumen, and are not as a rule suitable. Any tendency to dilatation of the myocardium should be warded off by rest in the recumbent posture, by feeding and by alcoholic stimulants, rather than by special heart tonics. Purgatives which reduce the strength should never be used; castor oil ʒss., or rhubarb and soda gr. x., in a capsule, or compound liquorice powder ʒss., or decoc. of aloes ʒii., fluid magnesia, ℥i., Friedrichshall ℥i., every morning, if necessary, are convenient doses for a child five years old.

## TUBERCULOSIS.

Fatal cases of febrile illness having a variable duration are met with in young children, in which the symptoms often fail to indicate disease in any special organ. After death nodules of miliary tubercle are found uniformly scattered throughout the three great cavities of the body. The physical signs during life are of an indefinite character, rendering a diagnosis of the seat of lesion impossible. The child is frequently out of health for some months before the illness can be regarded as serious. Whether this period of malaise is merely to be attributed to a faulty protoplasm or constitution, to a mere general debility, or is already the result of the deposition of tubercles, must remain a mystery. One thing seems clear, that infants are born with a proclivity to become the subject of these general morbid processes. In some cases there is nothing but the general tuberculosis to be discovered; the disease may set in with no more reason than typhoid fever begins. In other cases it is the immediate

sequel of whooping cough, measles, typhoid fever or some other illness. A principal part of the prophylactic treatment of tuberculosis consists in guarding the children against these complaints. In yet other cases no immediate cause can be discovered; the necropsy may reveal the presence of a large, evidently ancient cheesy gland, which may be regarded as the source of the infective process. The so-called scrofulous protoplasm or diathesis is especially prone to develop this general process of tuberculosis.

**Treatment**—*Prophylactic and Hygienic.*—The precautions to be taken in the general care and attention of the scrofulous are equally needed for those children whose parents are of tubercular stock, if not themselves actually tuberculous. And the supervision of all matters relating to the nervous, muscular, respiratory, circulatory, excretory and digestive systems must be carried out with the same assiduity. (See Scrofulosis.)

Even supposing that the bacillus is not the efficient cause of tuberculosis, no harm can be done by treating the child on the basis that Koch's theory is true. The soil and the seed must be taken into account. The soil is the protoplasm of the child. Attend to the health of this protoplasm—it must be placed in the most favourable circumstances, so as to enable it to defend itself against those influences which are known to deteriorate it. The introduction of the bacillus (the seed) must be guarded against. Hence the advisability of the child's not breathing air loaded with particulate matter, *e.g.*, the organic emanations especially from the *poitrinaire*, and thence its not living in town or city, but on the sea or sea coast, or at high altitudes. Excessive moisture is probably favourable to the growth of the bacillus, and is certainly deleterious to the health of the organism in general. On all these scores a well-drained country residence for as long a period of the year as pos-

sible must be recommended. Variation and attractiveness of diet, to tempt the appetite, is an important item in treatment.

The *diagnosis* of general tuberculosis is only to be guessed at with some degree of probability, unless definite signs appear in some organ or other. But of these cases with physical signs more later. Typhoid fever and repeated attacks of gastric, enteric or bronchial catarrh are most likely to be mistaken for the general tuberculosis. The symptoms consist of languor, variable fever often inverted or irregular in its chronology, cough, diarrhœa, constipation, ravenous appetite or loss of appetite, mental depression or unwonted liveliness, variable pulse rate and alterations in respiratory rhythm, emaciation and anæmia. If these symptoms have run on in straggling fashion without high fever for more than a month, then the diagnosis should be made, and will not often be erroneous. The "tubercular" aspect increases the probability of the diagnosis—tall, slim, fine skin, bright eye, long eyelashes, downy hair on back, long straight limbs, small chest and active habits.

The *diet* and *stimulants* required in acute tuberculosis must be of the kind required in all acute febrile diseases—beef tea, mutton broth, milk, and barley water, Mellin's food, brandy and egg mixture, meat juice, etc. There are no special indications beyond the necessities of the case and the complications. The treatment of this morbid process apart from the general management already indicated has hitherto proved hopeless. But it must not be supposed that tubercle is necessarily fatal. Probably general tuberculosis is always so. But it is certain that tubercles become obsolete, more especially in children, and there are no means of knowing whether these cases have been of the widely disseminated class, or limited to the confines of a few organs. The mother should nurse her offspring for more than 12 months, but

the presence of maternal tubercle should prohibit suckling. Having laid the greatest stress on the need for general treatment, we may sum up the other remedial measures by saying that each symptom must be treated as it arises.

*Expectant treatment.*—The various catarrhs should be resisted on the principles and details of clothing indicated so frequently in this book. Restlessness, sleeplessness, altered appetite and so forth, should receive all the medical care and comfort of which the practitioner is master. A word may be put in for *arsenic*. It may be given even when cod-liver oil and iron are also being taken. Arsenic does unquestionably attack all parts of the body and exercises some influence on the vital processes; it tends to alter these processes. It has been highly recommended in tuberculosis, and I am disposed to think that it is of some value. Drop doses of the liquor, or Fowler's solution, given after meals, is the best method of administration. It may be gradually increased in quantity, but should never be pushed to the extent of causing nausea, ocular irritation or puffy eyelids. Arsenic is said also to reduce the fever. The pyrexia may be treated by the icebag and by other antipyretic agencies.

*Specifics* so much vaunted have proved invariably valueless so far; but the syphilitic virus can be smitten if not slain, why not that of tubercle? If our present pathology is right there should be hope. Iodoform in half-grain doses in capsule, or with sugar of milk, has been tried freely; it should be given cautiously, for it is apt to induce unpleasant and even dangerous symptoms, though some children bear it well. Quinine sulphate or tannate may be given in ten-grain doses occasionally, for a boy five years old, if there be high fever (104°); it may have no effect, or only a temporary one. Salicin gr. iii., and salicylates gr. iii., or small doses of quinine, given regularly, have all been tried, but they are valueless. Large doses of salicin preparations exercise no permanent influence. Hypophosphite of lime, soda, or iron, in two-grain doses three times a day, for a child four years old, after meals, have been recommended; they are of no value in acute tuberculosis, in my experience. Phosphorus in gr. $\frac{1}{100}$ doses has been occasionally used on the same theory that arsenic

is given, viz.: that it has some action on tissue change; no good appears to have resulted from its use.

Bichloride of mercury, prescribed as in syphilis, has also failed. Terebene and turpentine, in five-drop doses, in syrup, honey, glycerine, or capsule, have been used.

## INHERITED SYPHILIS.

Seldom does the syphilitic disease show itself at the moment of birth. It would seem as though exposure to the accidents or circumstances of extra-uterine life make the dormant disease awaken into activity. Whether this is dependent on the new mode of alimentation, on the introduction of the new mode of respiration and oxygenation of blood, or on what, has not yet been discovered. Stillbirth is not evidence in itself of the syphilitic process having been at work in the fœtus. Death may be due to many causes besides actual fœtal syphilis. Syphilitic lesions undoubtedly occur in the fœtus. Pemphigus neonatorum, the bullæ coming out on the palms and soles and elsewhere, may occur within a week of birth, and is usually of serious prognosis. It is doubtful whether pure syphilis delays or accelerates the closure of the anterior fontanelle. Of the coryza, with snuffles, stomatitis and sores at the angles of the mouth, of the anal excoriations and ulcerations, the "hammy" rash on the buttocks, hams and calves, the hoarse cry, coppery scaly cutaneous areas in every part of the body, no further mention is necessary in a work of this kind. The enlarged spleen, which may increase in size whilst other syphilitic phenomena disappear, may be of help in diagnosis.

Syphilis leaves no organ, no tissue untouched in the infant or child. We need be surprised by no lesion in inherited syphilis. It affects the lungs, the heart, the liver, the spleen, the bones, the lymphatic glands, the arteries, the membranes and the brain.

"*Syphilitic pseudo-paralysis*" is essentially a morbid pro-

cess at the end of the vascular shaft in the area of junction between the diaphysis and epiphysis; it is a symmetrica disease, and affects infants almost always under ten months of age. It may lead to separation of the epiphysis, and even to suppuration in the joint. There is usually some swelling about the periosteum in the neighbourhood of the diseased growing end of the bone ; but the swelling is situated a little farther away from the joint than that of rickets, and the disease does not affect the cartilage so much as it does the vascular bone; its chief seat is on the shaft side of the calcified lamina of cartilage. The paralysis results from the tenderness and pain on movement, and from the separation of the epiphysis. There is no alteration in the faradic reactions of the muscles about the part, and when the knee region is affected, the knee jerks in some cases are even exaggerated.

*Other syphilitic lesions.*—Dwarfed and notched central incisors, chiefly the upper (resulting from want of development of the middle denticle) and dome-shaped molars ; nodular or diffuse thickening of those bones which have subcutaneous surfaces—clavicles, ulnæ, tibiæ and the external malleolus of the fibula ; depressed nose-root ; perforation of nasal septum ; frontal and parietal bossy growths ; cranio-tabes ; anal condylomata ; interstitial keratitis, iritis, and disseminated choroditis ; necrosis of palate and obliteration by adhesions of the passage between the posterior nares and the pharynx ; ulceration of the larynx and chronic relapsing laryngitis.

The superficial diffuse inflammations of the nasal and oral mucous membrane and of the skin about the napkin region as well as of the face are usually seen during the first months of life. The process in the bones may be seen at the necropsies of very young infants and also in the dead fœtus. The condylomata about the anus are not often seen till after

the teeth have been cut. Besides the junction of mucous membrane with the skin and the diaphysis with the epiphysis, any other site in which active growth is proceeding may be the seat of perceptible syphilitic change. Physiological activity and the activity resulting from external irritation often determine the site of syphilitic disease; the beard, moustache, and whisker regions are favourite sites of syphilitic eruptions. The chief seats of osteitis in the flat bones of the skull are not the eminences.

Syphilitic ulceration of the lingual frænum was once shown me by a mother in her first child a month old, which she brought for hooping cough. One week later a black eruption spread all over the skin and mouth, and death followed.

I have asked myself the question whether inherited syphilis in the children of parents who have worked in lead is not usually severe.

Of the white hepatisation (so-called pneumonia) of the lung in new-born syphilitic children, and in those a few weeks old, I have seen several examples. Circumscribed areas having characters which could be mistaken for those of gummata have been found; there is also a more diffuse syphilitic fibroid overgrowth. Similar changes occur in the heart, kidney, liver, and perhaps the spleen, though the enlargement of the spleen is usually a general one. Miliary gummata are mere collections of small round cells having a strong propensity to become fibroid; gummata in the liver and other viscera may become fibroid and largely absorbed—retrocedent gummata. Atrophy and sclerosis of the whole or of any part of the brain may be due to congenital syphilis; these changes may occur alone without arteritis or meningitis or they may be so associated. Gummata may be seen in the substance and membranes and on the nerves.* Paralysis of

* See cases by author in "Brain," 1883, and "Path. Trans.," 1889.

limbs from syphilitic infiltration of nerves remediable by mercurial inunctions, has been described.

The diagnosis is seldom difficult in the first weeks of life. If a child is ill at this period, *bad feeding* and *syphilis* should never be absent from the practitioner's mind. The syphilitic cachexia with its old-looking face is well enough when it is present, but it is more frequently absent in the majority of syphilitic infants that come under my care. Often, indeed, chronic snuffles and sore bottoms, with a few coppery or dry scaly spots about the body, are the only evidences of syphilis; the infant may even appear otherwise in perfect condition; atrophy, anæmia and asthenia may be looked for in vain.

Cylindrical finger and toe nails having a yellow staining suggestive of nitric acid, in which tint the soles and palms may participate, is never seen, I believe, without there is profound syphilization of the infant. A parchment-like skin shrivelled and of dusky tint, and a dry scaly eruption about the moustache and beard region may then be seen. Then is the most frequent occasion for finding hard swelling of both testicles, with or without hydrocele.

During the first years of life necrotic "wash-leathery" patches and serpiginous ulcerations may be seen on the tongue; a diffused warty-looking surface with some submucous induration may be seen in children a few years old, and also gummata more deeply seated in the tongue; cachexia may or may not attend these manifestations; other signs of syphilis in the bones and viscera may not be present.

A fatal case of interstitial hepatitis in an infant five months old had epistaxis, hæmatemesis, and melæna as its chief symptoms; not much emaciation, great anæmia, slight ascites. The elder brother of this child, aged four years, had hydrocephalus and bossed skull, and is still improving under

treatment.* Syphilis is a cause of hydrocephalus which is then not unfrequently cured by mercurial inunctions best applied to the head and neck. Syphilitic ascites may occur in infants a few weeks old; the liver need not be enlarged; sometimes a large gland in the portal fissure is the mechanism. I have seen at least one case of extreme ascites cured by mercurial inunctions and careful feeding; there was a dry, scaly cutaneous lesion in this case. The septa or bands of Glisson's capsule may be specially affected and jaundice may result (peripylephlebitis syphilitica).

Subcutaneous abscesses resembling the scrofulous nodules may occur; they differ from the tubercular in their greater numbers, greater tendency of the induration to suppurate, greater proneness to bleed and to get well (see illustration).

The **treatment** of syphilis does not consist solely in the administration of mercurials and iodides. A suitable diet, careful clothing and abundance of fresh air often do much to remove a syphilitic taint and local lesions without the aid of specific medicaments. Cod-liver oil is of the utmost value. If the mother seems healthy the child should be kept at the breast, and all artificial feeding interdicted. It would be well to examine the maternal milk in order to ascertain as far as possible its quality. If the milk be not good, artificial rearing should be substituted. If the cachexia is marked a cotton wool dress from head to foot, and in cold weather the employment of the mechanical nurse, to prevent death from cold, should be recommended. No child is more susceptible to the influence of bad air, bad food, cold and damp, than a syphilitic infant. Therefore the nursery and out-door arrangements are of vital importance. A syphilitic infant needs fresh food; it will more readily become scorbutic than another if fed on condensed milk and artificial foods of the usual description. Dilute raw meat juice is specially valuable.

* Later on he died. See "Path. Trans.," 1889.

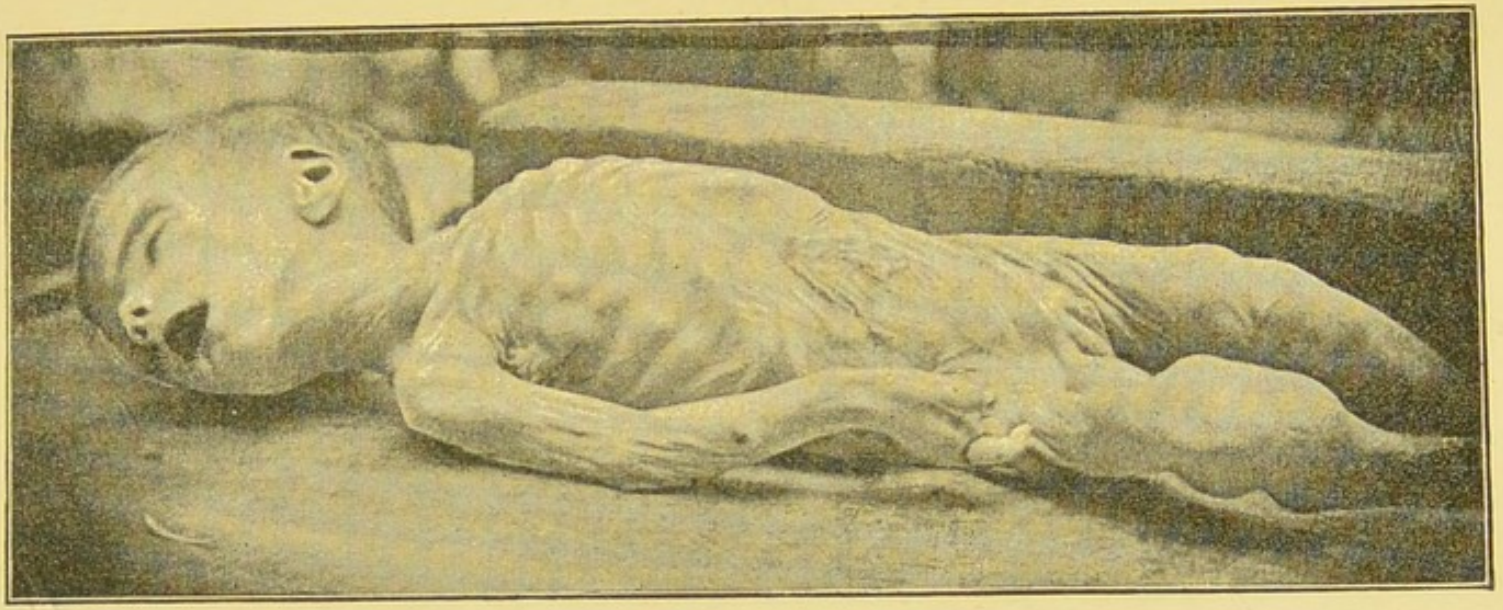

PLATE I.

A SUBJECT OF MULTIPLE SUBCUTANEOUS SYPHILOMATA IN A CHILD AGED FIVE MONTHS; THERE WERE HUNDREDS OF ABSCESSES, THE DEFORMITIES OF THE LEGS WERE SOLELY DUE TO THEM.

When the child goes out of doors in fine weather it must be kept warm by woollen clothing, and, if necessary, by hot bottles in the perambulator. During the heat of the day the shade must be sought, but the shady position should not be a cold one.

A child which is bodily ill with syphilis cannot be fed too carefully ; its welfare may require all the dietetic art of the practitioner. The stools should be examined to see that no curds, fat or starch are being passed undigested. Vomiting, diarrhœa and constipation must be relieved—not that there are any very special remedies needed in this disease to control such symptoms. Blockage of the nostrils from scabs may be easily treated by soaking the scabs away with sweet oil, never using water to the sores, and by treating the exposed raw surface with iodoform ointment, some of which may be placed far up the nasal passages with a fine camel's-hair brush. Great obstruction of the nasal passages from infiltration and scabbing often prevents efficient sucking. It should then be fed with a spoon or syringe. Active treatment should be directed to the nose, in addition to the mercurial medication.

Something is due to the attendants on the child, who should be warned that they may take the disease. Any abrasion or wound on the attendant's fingers must be carefully guarded ; she should not use the infant's linen for her own person. The linen must be washed at home after careful disinfection in Sanitas ʒii. to Oi., or carbolic lotion 1 in 50. The parents should be treated for the complaint, which may always be explained to both of them. Many of the mothers that I have seen in private practice are perfectly alive to the nature of the disease, and there need be no false modesty about the matter. Of course common sense in social matters should be one's guide.

The questions as to the maternal milk containing the syphilitic poison and the different modes in which the fœtus

may become infected are not in my province. A syphilitic infant may infect her nurse, and wet nursing should not be allowed.

The administration of mercury should be carried out intelligently. Most infants take a grain of that most constant mercurial preparation *Hyd. cum Creta* three times a day without inconvenience. Vomiting and frequent green stools may be indications for altering the mode of administration. Two grains of trisnitrate of bismuth or of prepared chalk may be added to the mercurial powder, the giving of which should be stopped altogether till the signs of irritation have subsided. Sometimes a grain of Dover's powder may be used to prevent excessive peristalsis or general motor restlessness. The practitioner should feel his way cautiously.

The liquor hydrargyri perchloridi, or Van Swieten's solution, in ℥xx. doses t.d.s., increased to ʒss. or diminished still further, may prove the best. It may be given after meals in aromatic water or decoction of sarsaparilla. Calomel, even in minute doses, of gr. $\frac{1}{12}$ four times a day, may occasionally suit the best, but it is usually more irritating to the bowels than the other preparations, and more depressing to the nervous system.

The ointment of mercury, especially that made with lanolin, is a most serviceable preparation for inunction. The homely flannel binder may be used if the effects are required for the system at large. But if any organ be the special seat of disease the effect of local inunction is often very surprising. This is a valuable mode of treating syphilitic laryngitis, meningitis and orchitis. Some care is necessary not to overdo the inunction. At first no harm would result from using a little every day. Infants seldom become salivated or suffer from any form of mercurialism. The effect of the inunction is greatly enhanced by the use of warm soap and water which is also necessary for the purposes

of cleanliness; the old ointment should be cleared away with soap before a fresh rubbing in takes place. The hyperæmia of the surface, resulting from this cleansing, and the removal of grease from the cutaneous orifices, are useful in aiding the absorption of the finely particulate mineral.

Extreme ascites in the syphilitic infant may be recovered from. A grain of mercury with chalk should be given three times a day, and blue ointment rubbed daily into the belly. In the case referred to the ascites lasted four weeks and did not return.

For the debility and arrest of growth which result from syphilis, and for most syphilitic lesions occurring after the first year of life, the employment of cod-liver oil and iron, or of the syrup of iodide of iron, is an efficient mode of medical treatment. But sea voyages and other general treatment are highly important (see Scrofula). Arsenic is of some value, given in drop doses with dram doses of steel wine after meals.

For the painful enlargements of the tibia and other bones iodide of potassium is most useful in large doses—gr. v. to begin with, for children 7 years of age—with decoction and liq. ext. of cinchona. Chloride of ammonium may be prescribed with the iodide, especially in cases of hepatic disease.

℞ Pot. Iod., gr. v.
Ext. Cinch. liq., ♏v.
Syrupi Aurantii, ʒi.
Inf. Cinch., ℥ss. t.d.s.

or ℞ Pot. Iod., gr. v.
Ext. Sarsæ liq., ʒss.
Decoc. Sarsæ Co. ad., ℥ss. t.d.s.

A little mercury continued for a few weeks is occasionally needed. Interstitial keratitis does not appear to be benefited by specific medicaments, though they are generally pre-

scribed. Avoidance of cold draughts on the head and eyes, is an important prophylactic.

My own practice is to discontinue the use of mercury as soon as all local signs of the disease have completely disappeared. The spleen may be enlarged still, but of that I take no notice. When the mercury is left off I trust to careful nursing and diet, fresh air, and cod-liver oil. And if a fresh sign appear renew the mercury. This method I believe to be preferable to the long continuance of mercury after the subsidence of all manifestations. The principle is that many syphilitic children have sufficient strength and vitality in their growth and development to throw off the disease. Not that I use mercury less, but that I like nature and general means more. As a matter of fact, my patients often take mercury for months together, but that is chiefly in out-patient practice, where the removal of unhygienic conditions is so difficult.

Calomel is sometimes used as a dressing to syphilitic condylomata and fissures, but I prefer iodoform.

The sanitary rose powder of boric acid is highly prized. I have not used carbolic acid or chloride of zinc to syphilitic sores in infants or adults, and never wish for anything better than the iodoform powder after the usual cleansing. Obstinate condylomata may be touched with nitrate of silver. All scabs and secretions must be removed with lard, or oil and wool, or forceps.

Warm baths of corrosive sublimate have been employed for the treatment of inherited syphilis. A convenient bath may be made of 3i. of the salt to two gallons of water. I have used it in two cases for a few days where most other preparations disagreed. Finally, I returned to the inunction of the blue ointment.

Other local remedies to syphilitic sores in children that may be used are the red oxide of mercury and nitrate of silver; doubtless they are equally efficient with the iodoform ointment, provided they be used discreetly.

Syphilitic perforation of palate and ulceration of the fauces require constant local applications to ensure cleanliness. Sprays of sanitas or

alum lotion, gargles of chlorate of potash, syringing with weak solutions of Condy's fluid, removal by forceps of obstinate shreds and exudations. These means will also promote healing. Painting the cleansed ulcerated surface with nitrate of silver (gr. x. to ℥i.) and blowing iodoform on it with the insufflator are very valuable.

Dry eruptions need simple cleansing and internal treatment. If obstinate, some lanoline mercurial may be rubbed in. Oleate of mercury, five per cent., is also used, diluted three times with olive or better, carbolic oil, 1 in 40. Blackwash is a useful local application to wet eruptions, but I prefer to use no water.

## RICKETS.

Two physiological specialities of children are excitability of the nervous system and liability to catarrh of the mucous membranes. In rickets the child is doubly a child in regard to its nervous system and its liability to catarrh. The bone changes and the new formations, though most evident, are far less important *qua* the life of the child than the catarrhal complications, the muscular debility, and the neurosal liabilities. A rickety infant is liable to fits of the whole body to tetany of the extremities, and to spasm of the larynx (see also Lichen Urticatus and Asthma). It is also prone to naso-bronchial, gastric and enteric catarrh. Its muscles are no better than its nerves. Both are weak and irritable. The whole protoplasm of the body is altered in rickets, and this is the result, not only of bad diet, but bad air and other hygienic defects. The liver and the spleen are also said to be the seat of rickety enlargement. These organs are sometimes found enlarged when other true rickety changes are present. But it is doubtful whether rickets *pure* and *simple* does enlarge these organs. My notes of cases would seem to lead to the conclusion that in these cases syphilis is co-operative. Rickets is by far the greatest producer of infantile diseases: it is par excellence the neurosis maker.

The "bossing" of the cranial bones, which Parrot put down always to syphilis, is doubtless frequently due to that diathesis,

but I have notes of a few cases in which syphilis appeared to be excluded, but in which the frontal bones were very thick and typically bossed. When rickets is the chief cause of the bossing, the frontals are most bossed ; when syphilis, the parietals.

The *diagnosis* of rickets is usually the easiest problem in diseases of children. The best indications are : beaded ribs, thick wrists, weak spine, convex backwards (cat's back)—loss of, or delayed power of walking, with excessive knee jerks and increased mechanical irritability of the nerves and muscles ; restlessness at night, the bedclothes being kicked off ; and sweating, chiefly about the head. The disease usually starts before the child is one year old. But cases do occur later. The disease called "*late*" rickets, occurring in children even over seven years of age, sometimes as the result of an acute specific illness, would appear to be well named. At all events there is in some of them that irregular overgrowth of the cartilage of the epiphyseal line which is regarded on all hands as an essentially rickety change (see illustration). "*Fœtal*," or "*congenital*" *rickets*, due to changes in the bones during intra-uterine life, is certainly not, as a rule, of the same nature as true rickets.

*Craniotabes* "parchment crackling" of the skull bones, or partial wasting of the bones of the skull, so that all the earthy matter is removed, is a rickety as well as a syphilitic phenomenon. These conical spots of atrophy of bone may be felt about the region of the posterior inferior angle of the parietal bones ; they do occur in other parts, and even rarely in the frontal bones. The atrophy is due to bone softening and to pressure of the head against the pillow, and of the brain against the bone. There is chiefly on the inner aspect of the calvaria, around the margin of the atrophied bone, a little sprinkling as of sand, which is a little scattered overgrowth of bone. It is an illustration of the well-known

PLATE II

A CASE OF "LATE RICKETS" IN A GIRL AGED FOURTEEN.

pathological law that where atrophy is there also is hypertrophy; for the same cause in a lesser degree causes overgrowth, and in a greater degree undergrowth or atrophy. The craniotabetic spots are most marked and are first seen in early cases in those parts of the bones where the convolution impressions are first and most marked. The atrophy begins from the inside, so that the fossa is widest at the internal table of the calvaria.

A good deal has been said of tenderness in rickets; Sir W. Jenner said the muscles of the thigh were as tender as those of the abdomen. Tenderness does exist in true rickets, I admit, but the practitioner will see hundreds of cases of rickety infants without once being struck with the tenderness of their bones or their muscles. *Scurvy* complicating rickets, with effusion of blood into the periosteum, is a tender complaint, and there will be no mistake about the tenderness in these cases.

The rickety "*rosary*," beaded ribs, anterior nodosities, are sometimes associated with posterior nodosities, situate about the angles of the ribs. Perhaps these latter begin as spontaneous fractures, or the strain on the ribs may be greatest there. The ordinary beading is most evident in the 5th and 6th ribs, and on the visceral more than on the cutaneous aspect.

The skull in rickets is said to be large and peculiarly shaped, dolichocephalic with a square forehead. Dolichocephaly means much longer than broad, but the opposite condition, brachycephaly, may obtain. The anterior fontanelle frequently does not close at the right time—eighteen months of age is an average period for its final closure. This fontanelle grows larger in healthy babies until they reach nine months of age, and then it gradually gets smaller. The margins of the flat bones of the skull are sometimes thickened, and the sutures may appear as furrows. As a matter of fact,

often furrows are due to large veins grooving the skull; these large veins are often mistaken for sutures.

The teeth are cut late in rickets. At times the child has only two instead of twenty at two years of age. Sometimes a year goes by before the first tooth is cut. The face, and especially the lower jaw and chin, are poorly developed in rickets. The systolic murmur audible in many cases of rickets about the anterior fontanelle, is of no practical value. There is sometimes an excess of fluid in the ventricles, and occasionally in the subarachnoid space. "Albuminoid" infiltration of the frontal lobes of the brain is due to anæmia and œdema; not to a special material. Large brains may occur in rickets; their histology is still imperfectly known. The relations of rickets with osteomalacia are obscure. In many cases of rickets there is a process apparently of rarefying osteitis, rendering the bone soft. Billroth describes osteomalacia as fungous, fatty osteomyelitis, which means an atrophy of bone with the development of fungoid granulations, some of which become fatty. This would put the process on a par with rarefying osteitis, were it not that Rindfleisch asserts that in osteomalacia the salts are first dissolved out and the soft parts of the bone remain a little longer. I have seen this appearance in some cases supposed to be simply rickety. Osteomalacia differs from rarefying osteitis in that the bony trabeculæ instead of being turned into sharply gnawed edges at the site of the disease, gradually grow thinner and thinner, but retain their smooth surface (halisterischer bone atrophy of Volkmann). Kassowitz contends that the so-called decalcified parts are really new formations, hyperplasia, and not inflammatory.

An interesting paper on the relations of rickets and osteomalacia was read by J. S. Bury at the British Medical Association, Liverpool, 1883.

*Rickets* and *syphilis* may certainly work together in the

same organism. I do not believe with Parrot that all rickets is a final expression of syphilis. Tubercle and rickets occasionally co-exist. Mothers who have produced rickety children require medical attention, and a wet nurse may be required. That children fed exclusively on the breast may become rachitic will rarely have to be acknowledged. Rickets may possibly be hereditary in a few cases. Rickets may occasionally be present at birth (congenital).

The **treatment** of a rickety child frequently requires attention to details. The stomach may have contracted bad *habits*, and may require re-education. The diet must be set to rights on the principles laid down in Chapter II. A diabetic diet for one week has a decided power of setting wrong habits right. It is particularly necessary to ensure fine division of all food. Minced meat, pounded chicken, and milk guarded by mucilage are good. A little good wine is valuable. The child must be restricted in its sugary as well as in its starchy food, because both cause acidity from fermentations. Mellin's food and other malted foods are valuable, because their starch is partly digested.

Diarrhœa must be controlled; the *stools* should be examined. As a rule they contain much slime and undigested starchy matter, as may be tested with iodine and examination under the microscope; they are extremely offensive and very acid. Careful regulation of the quality, quantity, and times of giving the food, as elsewhere laid down, will often alone be sufficient to remove the diarrhœa. The Mist. Ol. Ric. will also be found of much value.

℞ Olei Ricini, ♏v.
Mucilag. Tragac., ♏xv.
Syrupi, ʒss.
Aq. Menth. Pip. ad ʒj. t.d.s. for a child a year old.

Naphthalin in two grain doses, given in cachets or pilules is very valuable.

If acidity be not thus overcome—it is usually, however, due to fermentation of undigested starch or fat—some bicarbonate of soda, with rhubarb, if the stool is too pale, may be prescribed. If the number of stools be more than four a day, a drop of tinct. opii may be used to correct the excessive action. Opium should be avoided as far as possible, for it increases the night sweats and renders the liver less efficient. Sometimes constipation is present ; its causes are often the same as those of the diarrhœa. It may be necessary to use some simple aperient at the the outset of the treatment.

There is great necessity for abundance of *fresh air*. The child should go out every day if possible, and not in a closed carriage. The nursery must be ventilated day and night, summer and winter. There should be plenty of light also, and scrupulous cleanliness in the nursery. The bed should be well aired every day, and the bed linen frequently changed. The clothes must be suited to the weather ; the surface of the body should be uniformly protected; a close-fitting woollen binder for the abdomen is a useful precaution against rickety diarrhœa. The clothes at night-time should not be insufficient. It is best to have the child clad in a combination flannel, or woollen or knitted garment, reaching up to the neck and covering the whole body, legs, ankles, and feet. If the bed clothes get off then it would not matter. The nursery must be large enough for the requirements of nurse and child—at least 2,000 cubic feet, and then ventilation must be secured. If the child is still being suckled and is more than a year old it should be removed from its mother's breast. Careful cleansing of the skin every morning and night must be practised, soap being used at least once a day all over the child. The underlinen and flannels require frequent changing, for the body may sweat profusely, though generally not so much as the head.

Cold douches are very beneficial if the circulation be de-

fective. The feet may be placed in hot water and the cold water sponged over the head and trunk. A hot bath (temp. 98° F.) every day of nitro-hydrochloric acid has also been employed—six drams of the nitro-hydrochloric acid to six gallons of water.

Massage, as tending to moderate muscular debility, is very useful in rickets; it should be done all over the body. The limbs should be rubbed upwards, the muscles everywhere squeezed gently and stretched out between finger and thumb. Neat's-foot oil or olive oil may be used. Galvanism has been used to the weak legs (mothers often bring them for the paralysis), but children cry so much that it is best to trust to massage, for this is soon borne with equanimity, and there is no genuine paralysis. The inunction of oil certainly does good in itself; and cod-liver oil is frequently thus administered; it is malodorous, and discolours the skin. The inunction is best made fasting, to ensure more complete absorption.

The administration of cod-liver oil and steel wine is important. Half a dram of each, twice or three times a day, for a child a year old, is the general rule; but the motions should be watched carefully, to see whether the oil is passed away undigested; if so, the quantity of oil should be reduced. Sometimes the oil does not agree. (See Scrofula.) A pinch of salt placed on the tongue after the oil has been taken may prevent its repeating. Sometimes it is better borne if given with an alkali; this may be the case if there is acidity of the intestines.

Instead of iron wine or syrup of iodide some prefer syrup of lacto-phosphate of iron and lime. Some again object to syrupy preparations on the ground that they favour fermentation, acidity, diarrhœa and indigestion.

There are very few children who do not prosper on the *vinum ferri*. But dried sulphate of iron in gr. ii. doses or tinct. ferri perchl. ♏ii. each three times a day, may occasionally suit the child better, especially, I think, if it be very fat and flabby.

*Diarrhœa.*—Some prefer a preliminary saline purgative of alkaline sulphates, or fluid magnesia. Mist. Bism. Alk. is a useful antacid and calmative.

℞ Bismuth Subnitr., gr. iv.
Sodæ Bicarb., gr. iv.
Pulv. Tragac. Co., gr. iii.
Spt. Chlorof., ♏ii.
Aq. Carui, ℥ii. t.d.s.

A drop of opium tincture may be added.

*Convulsions, laryngismus, and tetany.*—Hygiene is of great importance, also abundance of fresh air and great cleanliness. Removal of any reflex irritation is an important rule. Cold douches may be used —properly regulated to the strength of the child, and with due regard to the intestinal and bronchial conditions. Sedatives of chloral and bromides are good. (See special sections.)

*General restlessness*, due to peripheral intestinal irritation, as well as to the morbid nervous system, in the early stages may be treated by alkalis (Mist. Carminativa).

℞ Sodæ Bicarb., gr. iii.
Spt. Am. Arom., ♏iii.
Glyc., ♏x.
Aq. Menth. Pip., ℥ii. t.d.s.

Some prefer fluid magnesia, ℥i. or ℥ii. t.d.s.

Bromides and chloral may be used; or the wet pack.

*Rickety bronchitis* requires great care; the section on bronchitis should be consulted; stimulant not depressant treatment should be adopted; collapse of lung, with its cardio-pulmonary consequences, is *the* danger.

The *copious perspiration* of head and neck may be treated locally by liniments of belladonna, and by the internal administration of drop doses of liquor atropiæ. I have never used these remedies in rickets, and have generally contented myself with bathing the parts with dilute nitro-hydrochloric acid or vinegar ℥i. to Oi. of water.

*Phosphorus* given in minute doses has been frequently employed in rickets. It should not be given in larger doses than gr. $\frac{1}{100}$ (dissolved in sweet almond oil) to a child a year old. A minim of the phosphorated oil may be prescribed thrice a day; it may be increased to two minims. There is no question that in animals these doses of phosphorus increase the activity of osseous growth, and Kassowitz and others have asserted their beneficial influence in rickets. It may be given in cod-liver oil. ℞ Cod-liver Oil ℥iiiss.; Phosphori, gr. $\frac{1}{6}$ ℥i. t.d.s.

A favourite prescription with the Germans is called linctus gummosus phosphoratus.

℞ Ol. Amygd., ℥i.
Phosphori, gr. $\frac{1}{6}$.
Pulv. Gum Arab. } aa. ℥ss.
Sacchar. Alb. }
Aq. Destil., ℥iss., ℥i or ℥ii. t.d.s.

*Phosphate of lime*, in two-grain doses three times a day, may be prescribed. It constitutes an important part of Parrish's chemical food. If the child is at the breast the nurse may take five-grain doses three times a day. I have used this salt in combination with cod-liver oil with good results. *Syrup of iodide of iron* may be used in ten-minim doses three times a day, especially where there is a running at the nose or syphilis has been present. *Small doses of tannate of quinine*, gr. $\frac{1}{2}$ or gr. $\frac{1}{4}$ of the sulphate, are also recommended four times a day for a child a year old; it should be given in glycerine. Both these agents are antiseptics, and the beneficial action, to which I can bear personal testimony, is probably due to this antiseptic influence.

*Lime water and carbonate of lime* (five grs. of the powder thrice a day) is said to improve the nutrition. This is very doubtful. Its beneficial effect in rickets is solely attributable to its removing acidity and relieving diarrhœa by its astringency.

The treatment of the *bone* deformities comes within the province of the surgeon. But the physician should recommend the child to be kept off its feet. If there be slight deformity, putting a padded splint between the legs and binding the latter to it with a flannel roller at night-time may be ordered. For *loose ligaments* the general tonic treatment must suffice, but massage improves their nutrition, and alternate douches of hot and cold water followed by friction with a flesh glove is a useful procedure.

*Prevention of deformities.*—The bed should be made of firm smooth mattress and have no high pillows. Sitting up or walking for any length of time should be prohibited till the bones are consolidated. Splints can only increase muscular weakness during the active stage of rickets.

**Osteomalacia.**—Softening and great thickening of the bones, from new formation, occurs in childhood in hereditary syphilis.

In cases of so-called osteomalacia of childhood the question

is, are the changes due to rickets, to syphilis, to both combined, or are they dependent on other causes?—rickets and syphilis having nothing to say in the matter. Cases have been described by Rehn, in which the whole skeleton, but especially the long bones, were softened, flexible, and thinned; there was some characteristic rachitic digitation of cartilage at the junction of the shaft with the epiphysis; fractures easily occurred; craniotabes was sometimes present. Sweating without fever and splenic enlargement were sometimes noted; in all anæmia and emaciation were present. Restlessness and sleeplessness, with tenderness on movement, were features of the early stage. The children were under two years of age. Thus it will be seen that there were plenty of the characteristics of rickets in these cases, whose clinical history lasted several months, and sometimes ended favourably, so far as is known. The bones were thickened in places by the formation of massive porous bone. In rickets such new formations of osteoid tissue occur beneath the periosteum and throughout the bone. Animal rickets is also characterized by softening of bone and by deposits of new porous osseous material. The treatment of osteomalacia consists in taking care that the bones are not injured, and in supplying good nourishment—in fact, the treatment of rickets.

**Fœtal rickets or fœtal cretinism.**—Large head, large belly, thick stunted limbs, depressed nose root and abundant formation of subcutaneous fat are features of the fœtal rickets, which so far looks like cretinism. The thyroid gland may be normal or enlarged. There is none of the characteristic cartilaginous digitation as seen in rickets at the junction of the shaft with the epiphysis. A fibrous lamina usually intervenes between the shaft and epiphysis, and this has grown in from the periosteum. Premature anchylosis of basisphenoid and basi-occipital is found as in cretins. The membrane bones, clavicles and calvaria, are well formed, or indeed over-

grown with hyperplasia. The brain may be deformed as the result of the shortening of the basis cranii and the over-development of the vault; sometimes hydrocephalus is present; the heart may be malformed. Such cases usually die at birth. There is not the least physiological reason against the occurrence of intrauterine rickets, and that it does occur can scarcely be doubted.

## PERNICIOUS IDIOPATHIC ANÆMIA.

Fatal cases of anæmia occur in children in which careful post-mortem examination fails to find any other lesions than fatty degeneration of many parts (such as the heart, liver, kidneys, blood-vessels), and hæmorrhages into the retina and serous surfaces, skin and mucous membranes. The degree of anæmia is then so profound that both the fatty metamorphosis and blood extravasations are regarded as its consequences. The cases are almost perfectly parallel to the pernicious anæmia of the adult.

The symptoms are breathlessness on movement, apyrexia with variable fever, vomiting, progressive decolorization, and asthenia without much wasting. The febrile attacks are not easily explained; occasionally as in adults a catarrh of the respiratory tract attends them. Similarly inexplicable attacks of hæmatemesis and melæna sometimes occur. I think the paroxysms of fever, of hæmatemesis, and of vomiting are of the same order and are neuroses; but how induced it is impossible to say. I cannot agree with Dr. West in thinking that murmurs are rare in children's anæmia.

Other symptoms—as headache, giddiness, constipation, palpitation, flashes of light, restlessness, and apathy—are probably mainly symptomatic of the anæmia, as the pyrexia, vomiting and hæmorrhages may be. At least there can be no reason why the visual nerve centres (flashes of light) should be the only seats of morbid nervous phenomena when there

is a continuous morbid blood state. Infants are said to differ from adults in having relatively fever blood disks and less hæmoglobin (oligæmia), but this may be questioned. The *treatment* is seldom successful. Though the case cannot be called pernicious unless it ends fatally, still I have seen a very remarkable degree of anæmia (20 per cent. of red blood disks and 20 per cent. of hæmoglobin) disappear under treatment, and yet there was no apparent cause for the disease. In what follows the treatment for severe anæmia, no matter what its cause or its termination is indicated.

*Prevention of expenditure of energy.*—Severe anæmia necessitates very careful treatment. Everything must be done to eke out the powers of the patient, to prevent unnecessary expenditure of force, and to improve the quality of the blood. We cannot put our trust in medicines. The whole of the surface of the body must be kept at a uniform degree of warmth, partly to prevent catarrhs and partly to lessen expenditure of force. This indication is fulfilled by keeping the child in bed, which also reduces the taxation on its respiratory, circulatory, and neuromuscular powers to a minimum. Even then there may be restlessness from nervous irritation, which may be combated by opiates, carefully given. Chlorodyne in five-minim doses, for a child six years old, repeated as few times as necessary, is the best preparation. If there be albuminuria, or if the opiates cause stupor, bromides gr. v., or chloral gr. v., in syrup, may be prescribed. The tendency of these agents to weaken the heart and lower the vitality and temperature should be remembered. The restlessness may sometimes be overcome by means of the wet pack. The child should be wrapped from head to foot in a damp sheet, and then closely covered with many blankets; this should be done for an hour, and may be repeated twice or thrice a day. It tends to improve the condition of the blood, and it may be combined with shampooing. Some re-

commend in addition the employment of massage, and in the successful case already referred to I used this measure. The rubbing was done once a day, and occupied fifteen minutes. The whole of the body was kneaded, but not roughly. I am inclined to believe that massage may be very useful in severe anæmia. The patient should have an atmosphere free from mechanical and chemical impurities. The emanations and excretions from such patients often smell offensively, but only partly from the constipation, which is a customary feature. If possible the child should be treated at the sea-coast; the situation should be high, the drainage perfect, and the air free from excessive humidity.

*Stimulants*—weak brandy and water, high-class champagne, good claret—are sometimes needed; they promote appetite and digestion, and thus renew strength. The dose should be small, and given with the meals. Attention must be given to the bowels, which should be kept open once a day by simple remedies. I am of opinion that salines are best. Eno's Fruit Salts in teaspoonful doses, or fluid magnesia, are often efficient, and children may take either readily. Iron will be of no use unless the bowels act regularly, and the iron appears to me to be better absorbed when salines are used as purgatives. The dose of the purgative should not be large, as purging reduces strength. Thirst is often a marked symptom, and small doses of cold filtered water may be allowed pretty frequently. Vomiting is often a troublesome symptom in severe cases. The food should be given in small doses, and much experimentation may be required to find a food that will keep down. Weak veal broth, chicken tea, grape juice, orange juice, barley water, iced strippings, beef-tea—all cold—will often remain when any form of milk, even pancreatized, is rejected. Asses' milk, unboiled or boiled, has proved of service. It is most important to give fresh foods wherever possible. One white of egg in cinnamon water, ℥v.,

weak raw meat juice, fresh lemon or orange juice, are valuable. Some cases of anæmia may be traced to the child's having had foods from which the element of freshness has always been wanting. The vomiting may be controlled by fractional doses of gray powder given every three hours; or arsenic in drop doses at similar intervals. In these doses mercury does not further diminish the amount of hæmoglobin, unless its use be continued for days together. A grain of Dover's powder may be given with the mercury, to increase a sedative effect.

**Hæmatinics.**—The best preparation of iron is the tincture of the perchloride in 5-minim doses four times a day in half-a-dram of glycerine freely diluted with water. The exsiccated sulphate of iron in 3-grain doses four times a day, or the simple vinum ferri ʒi. t.d.s., may be prescribed. I am not in favour of very large doses of iron. The bowels must be effectively open, or the iron will do no good. Iron fails in some cases which arsenic, alone or with iron, will benefit.

Saccharated carbonate of iron, reduced iron, or dialysed iron should be prescribed when other preparations of iron irritate. It is not always the iron that irritates. Frequently the stomach is deranged by or with the disease. Other medicines than iron may be given as gastric sedatives. It is curious that the acid forms of iron sometimes cure the irritable state of the stomach. Catarrhal conditions are best relieved by alkaline preparations. Henoch strongly recommends chalybeate waters, and, if the child be strong enough to proceed to some of the spas, doubtless the change of air and scene may also effect some benefit. In children some years old change of scene is not an imaginary therapeutic agent. Mental impressions may produce great changes in a child's health, both in the direction of producing or curing disease.

When arsenic is employed, small doses ♏ii. of the liquor arsenicalis given four times a day with the meals is the best

method. I have used phosphorus in gr. $_1\frac{1}{0\,0}$ doses to children five years of age, but without any apparent advantage. (See Rickets for mode of administration.) In one case I tried alone 5-grain doses three times a day for a boy five years old of the black oxide of manganese, but without good results, though it seemed to allay flatulence.

Massage is most useful when patients are confined to bed; it must not be roughly done, for bruising readily occurs in these patients. The child should be encouraged to take walking exercise or play in the open air if he be well enough; since tissue change is thereby promoted, and the supply of oxygen taken in is greater. In such cases both these factors are usually advantageous. Exercise and gymnastics should not be taken in an impure atmosphere, nor immediately after meals. In one case of simple anæmia, not very severe, forty per cent. of red blood disks, the boy would persist in running about immediately after his meals and this was apparently not detrimental. The entire physiological relationships of digestion and assimilation to exercise are not understood; no good is unmixed with evil and no evil unmixed with good, in therapeutics and in other science. If the child be in town his muscular exercise should be in open spaces where there is no dust, and where the ground is well drained. Muscular movements must not be carried to the fatigue point, or to the production of palpitation. Much perspiration generally indicates weakness or too violent exercise. Great care will be needed in such cases to prevent chill; the exercise may have to be dispensed with altogether. If the child has perspired freely he should not cool down out of doors; even in summer weather the sweat may wet the clothes and act as a cause of chill.

Some advocate an attack of violent and sudden purgation in the treatment of anæmia; in young women such sudden means does seem sometimes to rectify what was wrong.

Cold sponging is a valuable tonic and alterative in anæmia. The water should not be too cold at first, but as the strength of the child improves a better reaction may be obtained by employing colder water. The hypophosphites of lime or soda in one or two-grain doses t.d.s., have been used, but care should be taken not to upset the digestion. Syrup of lactophosphate of lime ʒi. is prized by some. Pepsin gr. v. with the meals, or pancreatin two hours after meals with bicarbonate of soda and nux vomica, may be given with a view to improve digestion.

## LIENOSIS—SPLENIC CACHEXIA.

Lienosis clinically consists in enlargement of the spleen, anæmia, and an extraordinary cachectic tint of surface which is best likened to a faded box leaf—dull yellowish white.

The anæmia entails œdema of the hands, feet, and eyelids, and a liability to hæmorrhages from the nose, into the skin and elsewhere. Henoch speaks of pseudoleukæmia in connection with this malady, but there is only a slight excess of leucocytes, and there need be no alteration in the proportions of white to red blood disks. There is no enlargement of the adenoid tissues. Most cases occur under the age of two years.

I have seen many examples ; nearly all were fatal, but they were out-patients. In the better classes there may be hope of cure. Henoch mentions several cures.

It is important to avoid malarial influences which are active in the causation in my belief, but this is not allowed by all. Slight rickets frequently coexists. A history of syphilis may be obtained, and sometimes actual evidence of past syphilis.

Treatment is of the utmost importance, but drugs are of subsidiary value. Infrictions into the skin over the spleen are useless. Injections into the spleen of carbolic acid 2

per cent., or arsenic 10 per cent. of Fowler's solution, must be utterly condemned.

The patient cannot have too much fresh sea air; the usual precautions, however, are necessary. Cold and wet should be altogether avoided. Some cases certainly do better on dry inland air. An impure atmosphere must be shunned out-doors, and prevented from polluting the nursery and sleeping apartments. There should be as little furniture as possible in the child's chamber; everything in the rooms must be washable; curtains and bed-hangings should be banished. Children do go to the sea-coast in search of fresh air, but not unfrequently fail to obtain it, because they are kept indoors with the room assiduously sealed against its admission. Emanations from sewers and drains should be considered. When the child goes out it must be carefully wrapped up in its carriage, which should not be one of the closed variety. Its face ought to be freely exposed to the air. Care should be taken to keep the extremities warm, the hot-bottle being used if necessary. Woollen clothing should be used to cover the whole surface, and the belly must be specially protected; for these children are doubly children in their proneness to catarrh. High and dry sea-coast sites may be chosen, and yet not too bracing; the hill outside old Hastings and the hills at Eastbourne are often suitable.

Stimulants are of similar value in lienosis as in anæmia. Small doses of brandy or champagne or high-class claret may be prescribed with the meals.

The diet should be of the nutritious order, and of the anti-scorbutic description. There is nothing better than raw or under-done meat, fresh lemon, or orange, or grape juice, fresh milk, preferably of goat or ass, new-laid eggs, mashed mealy potato, one a day, pounded breast of chicken, mashed head of cauliflower, and other green vegetables if the digestion and bowels permit. It is essential that the digestive apparatus be in

good condition. Vomiting, diarrhœa or constipation are to be relieved by ordinary remedies. Food and drink will have to be arranged in accordance with the gastro-intestinal state. The stools must be examined for undigested casein, fat, and starch, and rectifications of diet made accordingly.

*Internal remedies.*—I persevere for months with arsenic combined with iron.

℞ Fowler's solution, ♏ii.
Vin. Ferri, ʒii. t.d.s. after meals.

The disease called lienosis is not remediable by anti-syphilitic remedies, even though there be evidence in the history and in the nose root and elsewhere of past syphilis. It would seem as though the syphilis had exhausted itself in the production of a condition not of syphilitic nature, as we suppose happens when locomotor ataxy or other degeneration of the spinal cord results from syphilis.

Large doses of quinine, with sugar as powders, or in syrup of orange, tolu, glycerine, or as granules, are highly recommended. Most works remark on the tolerance by children of quinine. I cannot endorse the universal large dose treatment either of quinine, arsenic, iron, belladonna, or prussic acid. I prefer to begin with small doses, and increase gradually, which method has proved entirely satisfactory in my hands.

Henoch stands by quinine and iron. Other preparations of iron may be used as in anæmia. Cod-liver oil may be prescribed with the usual directions (see Scrofula). Phosphorus, in gr. $\frac{1}{100}$ doses, t.d.s., for a child two years old has been recommended; I have not used it here.

*Fluoride of ammonium*, in five-minim doses, has been given to reduce the spleen. It must be administered cautiously. Fluoride of iron, as possessing hæmatinic properties, is thought to be better. Quinine may be given dissolved in water, or as a suppository by the rectum when vomiting precludes the oral method. It has also been rubbed in the form of ointment into the groins and axillæ.

*Infrictions.*—In the early stages of this lienosis cachexia, mercurial ointment may be rubbed into the skin, or oleate of mercury 5 per cent. painted over the spleen may be tried, but care should be taken lest the anæmia be increased and the spleen remain enlarged. Many authors, however, recommend friction of the left hypochondriac surface with simple salves

—neat's-foot oil, or sweet oil, soap liniment—and the procedure is entirely unobjectionable.

In some cases I have employed systematic massage for fifteen minutes twice daily. The cases did not recover, but perhaps the treatment prolonged existence, and did not do harm. It seemed to allay restlessness and vomiting, and increased the appetite. It is difficult to say altogether how it acts, but doubtless it promotes absorption of "fatigue" products and tissue change; it probably stimulates the living tissues also. Let me add that I merely wish to have massage extensively tried, and that I am not an advocate of any system, Mosengeilian or other. I truly believe that ordinary rubbing and kneading may do most that German or Dutch massage can.

Besides sea air, tepid sea baths are advisable. The water ought not to be used cold; if the child's skin glows after the dip into the bath it is a good sign. The reaction is what is desired. If the patient can respond to cold sea water douches they may be employed, but this should be a matter of experiment, and one of gradual trial. Such baths are not to replace the daily soap and water ablution of the skin, a process to be done in front of the fire in doubtful weather.

I have under my care a boy aged seven who has remained stationary for five years; arsenic and strychnia keep up his spirits and strength; his spleen is very large, and the tint of the face typical.

**Leucocythæmia.**—Leucocythæmia is a rare disease in childhood. Its features are progressive and continued increase in the number of white blood corpuscles, large spleen, progressive anæmia, and loss of strength; not much wasting, some irregular fever, often persistent at the close of the case, great tendency to hæmorrhage, and actual hæmorrhages from various cavities, into the retina and into and under the skin. Œdema is the result of the anæmia. Effusions occur into

the serous cavities. Its chronic febrile course, with enlarged spleen and sometimes with enlarged lymphatic glands and overgrowth of lymphatic tissue in the internal organs (intestines, mesentery, liver, kidneys, lungs), cannot be mistaken for any other disease, except tubercle, in which, however, the wasting is more and the anæmia less, and the splenic enlargement almost never so great. The spleen may be enormously enlarged, reaching into the pelvis, in leukæmia. A permanent marked increase of leucocytes does not occur in tubercle. Malarial and other emanations from the soil are given as causes. The medulla of the bones is rarely the seat of overgrowth of its soft tissues, and the bones may then be tender (myelogenic leucocythæmia).

*Treatment.*—The child's energy must be maintained in every possible way. The case is rarely seen till considerable disease is established. The clothing must be so arranged as to protect every part from cold and damp, and thus prevent excessive demands on the vitality. The patient should go out-of-doors in a carriage or perambulator when the weather is fine, every precaution being taken to keep him warm and free from damp and cold. Muscular exercise must be reduced to a minimum if the case is already advanced. Absolute rest is needed, so as not to tax the energies of the respiratory and circulatory organs when the anæmia is profound, and the total hæmoglobin greatly reduced in quantity. The food must be nutritious, and should consist largely of under-done or raw meat and raw meat juice. Orange juice and fresh lemon juice are also valuable. Fresh air is most necessary, and the ventilation of the patient's chambers should be rigidly attended to. Some sunlight is good. For other treatment, the section on anæmia may be consulted. The wet pack, as in fevers, has been used, on the idea that it not only reduces the fever and soothes the nervous system, but also promotes nutrition and makes blood.

Arsenic is, perhaps, of as much use as any other drug. It may be prescribed in drop doses, gradually increased, three times a day, taken soon after the food. Iron wine may be given with it; it acts in the capacity of an alterative, promoting tissue change. Cod-liver oil in minute doses to begin with should be tried in the same way as in scrofula.

Quinine exercises but little influence on the spleen or the disease generally, though it has been largely used. In any case it does not do harm, and may be prescribed in grain doses of the tannate or sulphate thrice a day. Mineral acids—of which nitromuriatic acid is the best—may be prescribed as a tonic, 5 minims in Inf. Gent. Co. 3ii., four times a day, an hour after meals, for a child 2 years old. The infriction of iodide of mercury ointment over the region of the spleen has been tried. Minute doses of mercury and chalk, gr. $\frac{1}{6}$, four times a day, have been given on the view that minute doses of this metal act as a hæmatinic. Phosphorus, in gr. $\frac{1}{100}$ doses thrice a day, has also been tried; and Dr. F. T. Roberts speaks highly of its use in adults. (See Rickets.) Galvanism likewise, the positive pole being put over the back and the negative moved about over the splenic region may be employed for ten minutes twice a day. Dr. Gowers asserts that it contracts the spleen, expels retained leucocytes, and stimulates the functional activity of the organ.

The faradic current has been used over the spleen. According to some, the white blood corpuscles are diminished in number after this treatment, which is done twice a day for fifteen minutes. Dr. Poore has noticed a temporary diminution in the size of the spleen from this treatment; he has observed an increase in the number of white blood cells immediately following the application.

*Injections into spleen.*—Arsenic, ergotine, iodine, and salicylic acid have been injected into the enlarged spleen, but they should never be employed again. Extirpation of the spleen is said to have always been fatal. Diarrhœa, constipation, fever, œdema, hæmorrhages, and pain must be treated as they would be in any other case.

**Lymphadenosis and Lymphosarcomatosis.**—The difference between lymphadenosis and lymphosarcomatosis is one of degree. The duration of the former is longer than that of the latter. The enlarged glands and overgrowths of adenoid

tissue, even in lymphadenosis, vary considerably in consistence and rate of growth. Sometimes the enlargements are soft and cellular, and at others hard and more fibrous. Whether leucocythæmia occurs or not, may partake of the nature of an accident. It would not be absurd to describe leucocythæmia and lymphadenosis together. Lymphadenosis is a chronic febrile disease, attended with enlargement of lymphatic glands and lymphatic tissues generally, and marked by anæmia, asthenia, and little wasting. Sometimes the adenoid hypertrophies occur mostly externally, and sometimes mostly in internal organs—spleen, intestines, mesentery, etc. There is extraordinarily little tendency to suppuration or caseation in the glands. I on one day had a post-mortem examination on a case of lymphadenosis and a case of caseous tubercle: the contrast between the dull translucent gray section of every gland in the former and the opaque, yellow, green cheesy section of every gland in the latter will be indelibly impressed on my memory. In lymphosarcomatosis a great tendency to the involvement of bones exists; the ribs, the calvaria, and the base of the skull are often affected; the eyeballs may be extruded from their sockets and boggy masses appear beneath the scalp. Its characters are much the same as in adults. Leucocythæmia is of much rarer occurrence in children.

The *treatment* of it is the same as that for leucocythæmia. The general management of hygiene, diet, clothing, sleep, exercise may be carried out on the same lines as for scrofula. Treatment is also directly aimed at the large glands. They may be removed surgically if accessible. Dr. Gowers advises operation, provided the red blood disks are not less than 60 per cent. of the normal. A slight increase in the white blood corpuscles need not preclude surgery.

*Infriction.*—Ointments of iodine, lead, and iodide of potassium may be rubbed into the skin over the glands, with

the object of causing absorption of the glandular overgrowth. Simple friction with sweet oil appears to be equally efficacious.

*Counter-irritants.*—Liniment of iodine and tinct. of iodine are also painted over them; these act partly as counter-irritants, and, being absorbed, the iodine may exercise some influence.

Fomentations, whether simple or of seaweed, are of little value unless the glandular enlargement be very rapid, when I suspect scrofula rather than lymphadenoma. Spirit lotions, and lotions of iodine and iodide of potassium, or chloride, or nitrate of ammonium, have all been employed as absorbents.

*The injection* of arsenic, iodine, eucalyptol, carbolic acid, and other agents into the large glands must be deprecated. The constant current of electricity has been recommended. I have used it without effect. The positive pole is placed at the back of the neck, and the negative moved about over the glandular enlargements of the axilla and neck; a weak current, of five to ten cells, Leclanché, may be used for ten minutes twice a day. I have thought that wet compresses to the glands of the neck has been followed by diminution in size; they were employed for two weeks together.

*Internal remedies.*—The internal administration of drugs is not very successful, but arsenic is the one which has seemed to me to prolong the course of a case more than any other. *I* do not give large doses, not more than three minims three times a day to a child three years old. Some employ much larger doses, both in these diseases and in chorea. Doubtless children tolerate them, but not always, and I am not aware of any advantage to be gained by the use of them.

Phosphorus, in gr. $\frac{1}{100}$ doses, is sometimes useful, but of course not permanently. See Rickets for its mode of administration.

Cod-liver oil is also valuable. Quinine, iron, and syrup of iodide and syrup of the phosphates may be prescribed. (See Scrofula.) Iodide of potassium, in three-grain doses t.d.s., and liq. potassæ in ℥iii. t.d.s. doses for a child two years old, have been said to reduce the size of the glands.

**Infantile scurvy – Acute rickets.**—Infants who are fed on prepared foods, in which the element of *freshness* is wanting, are liable to scurvy, which presents some peculiarities in the infant. Such infants are usually rickety also partly because the foods, besides not being fresh, are indigestible. The scurvy

shows itself as blood extravasations, which appear to have a special liking for the periosteum of the long bones, doubtless as a consequence of the more rapid growth of bone in infants. But the long bones may be the seat of hæmorrhage even in the adult scurvy.

Unlike the adult scurvy, the gums may be free from obvious sponginess and hæmorrhagic tendency. Slight points of hæmorrhage may be seen in the soft papillæ of the enamel bed. The spongy, bleeding gums would seem to be more common when the teeth are present, which they may not be at the time of the development of scurvy. Scurvy mostly occurs before the age of 18 months, and delayed dentition is due to the associated rickets. Hæmorrhages may occur in most tissues—intermuscular septa and muscles, skin and subcutaneous tissues, mucous membranes, and serous cavities.

Rickets is not an essential part of the disease; there may be no bony signs of rickets during life. Careful inquiry usually elicits the information that about the onset of the hæmorrhages the food was always wanting in the element of freshness. In nearly all the collected cases the food was exclusively of the preserved kinds—Nestle's, Neave's, Ridge's, Savory and Moore's. The chief symptoms are great tenderness and pain, with cachexia, in which there is marked anæmia, doubtless due partly to the hæmorrhages. A baby which is both very white and very tender has probably got scurvy. The epiphyses of the bones may separate, then there is still more inability to move the limbs—a *pseudo-paralysis*, something like that seen in syphilitic bone disease in infants, which are, however, usually of a younger age than those suffering from infantile scurvy. Signs of syphilis, besides the pseudo-paralysis and bone swelling about the junction between the shaft and epiphysis, may be present to help the diagnosis. The swelling of the limbs in infantile scurvy is usually wider spread along the shaft, and is greater in degree.

The tenderness and brawniness of soft tissues is evidently not due to bony overgrowth, and so cannot be confounded with the diffuse periosteal ossifying growths sometimes seen in syphilis during and after the first year of life.

Infantile scurvy seems sometimes to mend of itself, but the scorbutic character of the malady is further testified by the rapid improvement that ensues on the administration of fresh foods.

Local treatment is of the greatest importance. If there be separation of the epiphysis the limb affected should be well supported by sand bags at the sides of the limb, or the application of light cardboard splints.

I have treated two cases by covering the thighs with lint, and allowing spirit evaporating lotions to be frequently dropped on. Cold wet compresses, well wrung out, may be used during the tender stage. When the swelling is disappearing, shampooing the limb gently and the infriction of neat's-foot oil are valuable modes of getting the last of the clot absorbed. This should be performed twice or thrice a day for ten or fifteen minutes, and preferably just before a meal, for the system will then be in its most absorptive mood.

*General treatment.*—But the local treatment is insignificant, compared with the simple ingestion by the patient of a little raw meat juice, barley water, and fresh goat's milk, or cow's milk, or ass's milk and some fresh lemon juice, or orange or grape juice. A diet list should be drawn up, prescribing a little food every two hours, and consisting of the above-mentioned articles.

Naturally the bowels and digestion must be looked to. If there be vomiting and marked anæmia with constipation, the rectum should be emptied by an enema of soap and water, and half-a-dram of castor oil. Then iced raw meat juice with ten drops of brandy, or ass's milk (or fresh cow's milk and

barley water or isinglass) with the brandy, will usually be kept down.

There may be no difficulty with the feeding. All that is then necessary is to give the fresh food. Potatoes mealy and mashed, smashed apples, turnips, cauliflower, pounded underdone meat or pounded fish, if the child be over a year old, may be given in small quantities. Lemon juice, fresh grape juice, and orange juice are simply invaluable.

The anæmia may be met with vinum ferri ʒi., and Fowler's solution ♏i., t.d.s., or some other iron preparation. Cod-liver oil in small doses, the stools being inspected to see that it is digested, is useful to promote a return to health, and the more so if rickets be present.

However strong the syphilitic history may be, mercury should not be given till the anti-scorbutic system has failed. It is very doubtful indeed whether syphilis can make such periosteal extravasation or its simulacrum.

In one case where the scapulæ, tibiæ, femora, and ribs were involved, the wet pack was used, as in fevers, and with manifest relief to the child's distress.

Fever is frequently coexistent in these cases, and is perhaps due to the nervous excitement produced by hæmorrhages into such tense structures as the periosteum. Simple hæmorrhages ought to lower the temperature of the body not to raise it; fibrin ferment is however pyrogenic. No evidence of inflammation has been found when the sanguiferous periosteum has been examined after death.

The necessity for fresh air, warm clothing, sunlight, and cutaneous ablution is urgent. Draughts, chills, and wet should be avoided. Even if the legs be broken by separation of the epiphysis, the child should go out of doors in a perambulator and lying down full stretch, with its face exposed to the air, but not to a strong sun. There is seldom any need for the use of opiates or sedatives. A drop of laudanum may

be given occasionally if the infant appear in great distress. This is better than chloral or bromide.

**Purpura—Morbus maculosus** (Werlhofii).—Purpura owns, like anæmia and other symptoms, a thousand different causes. Purpura morbillosa, scarlatinosa, etc., are not commendable terms, as any malignant acute specific may be attended with symptomatic purpura.

Purpura rheumatica may possibly occur in genuine rheumatism, but frequently the rheumatism is false—mere pains and tenderness with arthritic swellings having no migratory tendency, and probably in many cases anatomically due to blood extravasation.

Genuine idiopathic purpura may be slight and cutaneous (p. simplex), or severe and universal (p. hæmorrhagica). The disease is not scurvy, for it in no way depends on want of fresh meat and vegetables. It is not hæmophilia, for it does not last for ever, being a mere episode in, or termination of, the child's existence. It is not a malignant acute specific fever, for the sudden onset with high fever is absent.

Usually vague pains and a few symptoms of indeterminable character are the warnings of the disease. But hæmorrhages may be its first declaration. The bleedings may occur in any tissue, even into the firm testes, where I have thrice seen them in boys. Micro-organisms have once been found in the thrombi of vessels at the seat of hæmorrhage, but not in the circulating fluid. Death may ensue from the uncontrollable bleedings and their consequences—anæmia, fatty degenerations, syncope.

*Treatment.*—The patients should be confined to bed. All movements seem to increase hæmorrhage, and any accidents cause bruising, sometimes of extensive and alarming character.

Gravitation seems to be operative in the induction of the ecchymoses and petechiæ in the lower extremities—another reason for the recumbent posture.

Though freshness of food may have had nothing to do with the causation, it is advisable to prescribe foods having this important quality. (See Scurvy.) Any insufficiency of food may have had some share in the etiology. The dietary should be nutritious and adequate, containing fresh animal and vegetable proteids, fats and carbohydrates—eggs, meat, cauliflower, well-done potato, little fruit, etc., but there may be vomiting when small doses of cold fluids alone should be given. I think an exclusive meat diet for a few days is occasionally an advantage.

The hygienic conditions of fresh air and clean clothing, with customary ablutions, should ever be remembered.

*Purgatives.*—When the disease attacks robust children with plenty of blood there is nothing to compare with the treatment by sudden temporary saline purgation such as succeeds sometimes in anæmia. The form that I prescribe is sulphate of soda and sulphate of magnesia, of each half-a-dram, dissolved in hot water, and an ounce of compound infusion of senna (U.S.P.), for a child four years old, taken on an empty stomach. This may be given twice or thrice a day for two days, but not longer.

*Supporting plan.*—But such purgation is generally useless when the child was previously cachectic. A more supporting plan is indicated. Never hesitate to order alcohol—brandy, in dram doses four or five times a day in milk or other vehicle. Stimulants may be needed, no matter how the disease began; they are valuable in the same manner as they are in anæmia. They do not increase the hæmorrhages as might be thought.

The tincture of the perchloride of iron is that usually prescribed, and in full doses; partly as a hæmatinic, partly as an astringent. Ten to fifteen drops may be given in glycerine ʒi. to Aq. ℥ss., for a boy four years old, repeated three or four times a day. Arsenic may be combined with it.

℞ Liq. Arsen. Hydrochl., ♏iii.
Tinct. Ferri. Perchl., ♏x.
Glyc., ʒi.
Aq., ʒss.

Some practitioners use arsenic alone, and with good results, in purpura.

Turpentine I have frequently seen tried in severe cases. It should be given in large doses; half-a-dram in a gelatine capsule disguises it best. It is very nauseating. The compound almond mixture, honey, syrup, and glycerine, hide its taste somewhat. Dr. Gee is greatly in favour of the employment of large doses of turpentine in desperate cases. It may be given per rectum with mucilage of tragacanth ʒi. to ʒss. Some practitioners give five or ten-minim doses of turpentine. Hæmaturia would contra-indicate large doses of turpentine according to some physicians. Tincture of larch bark—twenty minims frequently repeated—is another remedy of which I have almost no experience.

Liq. ext. of ergot in ♏x. doses, or in larger doses less frequently, has been tried. I saw it used in two fatal cases.

Quinine sulphate, gr. i., dil. sulph. acid gr. iii., and tinct. ferri perchl. ♏x., glycerine ʒi., Aq. ʒss., is a favourite prescription with some physicians.

Gallic acid, gr. x., t.d.s., is used for purpura, especially when complicated by hæmaturia.

Tannic acid may be prescribed in its stead. Similar doses of dried *alumen* has given success in some hands. These doses are suitable for children about five years old. I have rarely seen them all tried but without apparent good result.

Acetate of lead gr. ii., and opium powder gr. $\frac{1}{6}$, was prescribed three times in one successful case in a boy six years old. It is difficult to say whether the lead did any good. A little *opium* is of service when there is great restlessness and tossing about, as happens frequently in fatal cases. Convulsions may usher in hemiplegia from bleeding into the motor region of the brain.

*Local applications.*—Where the hæmorrhage is accessible local applications may be made. Ice is most valuable, also hot water (110° F.). Pressure or compression by means of conical compresses are certain means of arresting the bleed-

ing if they can be applied. A multitude of styptics and astringents are recommended for causing coagulation and constringing vessels : perchloride of iron, sulphate of iron, dried alum placed on the bleeding surface, are some of the best.

The breath is often very offensive, and the mouth foul ; the teeth and mucous membrane of mouth and fauces should be kept sweet and clean by syringing and moppings (soft rag or lint) with cold antiseptic lotions or hot water.

*Epistaxis* may be treated by iced water injections. Dr. Eustace Smith advises spraying with a solution composed of two drams of strong perchloride to two ounces of water, first washing the nasal cavities out with iced or cold water.

He uses also powerful purges, marked anæmia notwithstanding, provided the case had not supervened on cachexia or was of the acute kind : two drams of oil of turpentine and two of castor oil made into an emulsion with mucilage of tragacanth, and flavoured with syrup of lemons and peppermint water. If the liver be swollen from hyperæmia the purging is all the more indicated. I have tried sweating doses of nitrate of pilocarpine with perhaps some good effect. Many cases do well of themselves ; it is therefore difficult to gauge the action of remedies.

**Hæmophilia.**—Bleeders usually inherit the disease from their mothers, who are commonly free from the diathesis. The term hæmophilia neonatorum is perhaps not strictly correct, for usually the true hæmophily is not manifested till after some months have passed by.

Hæmorrhages are liable to occur from the mucous membranes and into the skin without any obvious cause, or as the result of a very slight exciting cause. No constant changes have been found in the blood or vessels, and it is possible that the disease may depend on derangement of some central nervous centres. It is well known that experimental irritation of the pons Varolii may cause widespread blood extravasations. It is essential that the diathesis be persistent, otherwise it would not be distinguishable from

some cases of purpura. Hæmorrhages occur into the joints, and the cartilages may become eroded. It is doubtful whether all the joint swellings are of hæmorrhagic nature.

I think hæmophilic subjects are often the subjects of minor neuroses and neuroses run in the family : generally the neuroses are of a paroxysmal sort ; they may be overlooked because attacks of lowness of spirits and faintings are so often set down to a weak action of the heart instead of to a perverted action of the brain.

As bearing on the question whether the diathesis is congenital, I may say that I have made an autopsy on a boy aged 5, who died of diphtheria and pneumonia. He was an idiot. The right half of the brain and some part of the left was atrophied as the result of hæmorrhage into its substance. The nose frequently bled spontaneously. Several of his brothers were bleeders, and one had died of the bleeding. There was a marked history on the mother's side. It is only right to add that the cerebral hæmorrhage probably occurred at birth, and most likely as the result of the instrumental delivery.

The teeth should never be extracted in bleeders; they should be allowed to be shed ; but still the care of the dentist to keep them, and see that they grow regularly and in their right places, is desirable.

Fresh food is necessary ; salty and stale foods ought to be avoided. The principle is to prevent any scorbutic tendency ; for hæmorrhage is liable to occur from the gums ; scurvy would increase this prospensity. The gums should be kept hardened by the careful and regular use of the tooth brush and some astringent lotion ; chlorate of potash gr. x to ʒi. and warm water in equal parts, or alum, tannin, or rhatany lotions may be employed. These are more necessary when any sponginess of gums or looseness of teeth exists.

The proneness to bleed is increased when the general

health is any way disturbed, though curiously not when any definite illness exists—such as pneumonia, measles or hooping cough. The neuro-muscular apparatus may be kept in good condition by outdoor exercise, but the violent games, including cricket, hockey, and football, are better prohibited. Emotions and mental excitement sometimes apparently induce an attack of bleeding either from the nose or into the knee-joint. Fresh air, free from mechanical, chemical, and physical impurities, is valuable for respiratory purposes, and for keeping the respiratory organs in sound condition. Avoidance of cold and damp climates wards off constitutional diseases. Exercise also promotes the action of the bowels and prevents portal congestion. Constipation is to be specially avoided. The best purgative is mercury and a black draught—calomel gr. iii. for a boy 7 years old over night, followed by ʒss. each of sulphate of soda and sulphate of magnesia, taken hot before breakfast with an ounce or half-an-ounce of the compound infusion of senna of the U.S.P. If the constipation continue after this, and in spite of attention to the dietary, other measures may be necessary. (See Constipation.)

The renal functions ought also to be acting efficiently. This end is promoted and the action of the bowels also by the imbibition of sufficient watery fluids every day. There is reason for believing that any overloading of the blood with waste products increases the propensity to bleeding. This overloading may occur from insufficient fresh air, inadequate hepatic and renal excretion, and of course from intestinal accumulation.

*Epistaxis* frequently requires treatment.

If possible, the nasal douche with ice-cold water should be used, or syringing the iced water into the nostrils. I have heard of very hot water being tried successfully also. It may be necessary to plug both anterior and posterior nares with Belloc's sound or its equivalent. Some

recommend the injection of astringents, such as perchloride of iron 3i. of the liq. fortior. to ℥i. of water. Wherever possible nothing is so efficient and so little liable to be followed by sloughing and ulceration as simple compression. This is the method for arresting hæmorrhage after tooth extraction. The extraction may give the first sign of the existence of the diathesis.

Persistent and continuous bleeding is best averted by a powerful purgative, the patient being kept in the horizontal position. Nature staunches the more acute hæmorrhages by an approach to syncope.

Hæmorrhage from the rectum may be controlled by a smooth cylinder of ice inserted within the sphincter. Injections of iron and very hot water (105° F.) are also lauded.

Liquid extract of ergot in frequent ♏x. doses has been recommended for urgent bleeding. The hæmorrhage is generally from capillary vessels, and ergotine contracts the arterioles; though whether the raised blood pressure would promote hæmorrhage is not answered.

Turpentine, rectified spirits of, in half-dram doses, have been employed. Hæmatemesis has ceased under its administration in my hands, but it frequently fails, not only in "bleeders," but in other cases of hæmorrhage.

*Joints.*—Large extravasations of blood under the skin and into the joint may be treated by cold wet compresses under oil-silk frequently renewed and associated with uniform careful pressure by bandaging. Strapping with Scott's dressing if the knee-joint does not seem to be returning to the normal size and shape is very useful. Blisters and iodine have been tried to reduce the chronic arthritic swelling. I have not used them nor seen them used. The actual cautery should not be employed.

After much bleeding or extravasation of blood profound anæmia with great diminution of the red blood disks is seen.

Then rest in bed, careful nursing and feeding are called for. (See also remedies for severe anæmia.)

# CHAPTER V.

## RHEUMATISM.

THERE are great differences between the average rheumatism of children and the ordinary run of cases of rheumatism in adults. But the migratory tendency of the arthritic manifestations, the tendency to relapse, and the widespread lesions are some features in common. I believe there is a type of children's rheumatism. A typical case of rheumatism in a child may be pictured as one that presents in the course of a single attack of the malady the following phenomena: Erythemata, subcutaneous nodules, joint affection, endocarditis, pericarditis, and chorea. All these phenomena or links of the rheumatic chain may be seen in the course of a single attack of rheumatism in a child. The children's rheumatism is characterized by the frequency of erythemata, nodules, endocarditis and chorea, and by the slightness of arthritis, pain, pyrexia and sweating. Sometimes the swelling of the joint appears to be outside rather than inside the joint. Indeed, there is abundant reason for thinking that tenosynovitis with effusion occurring in the neighbourhood of a joint has been mistaken for actual arthritis.

The slightness of the pain and tenderness rather favours the view that the effusion is not great within the joint. The swellings in children's rheumatism are well seen as cushion-like elevations about the backs of the wrists and the dorsa of the ankles. The painless and inconspicuous subcutaneous nodules, composed of delicate fibrous tissue, are situated about the elbows, patellæ, and malleoli for the most part; but they may be found on the vertebral spines, the spine of the scapula,

the line of the clavicle, the crest of the ilium, about the extensor and peroneal tendons of the hands and feet, the pinna of the ear, the temporal ridge, the forehead, and the superior curved line of the occiput. They are usually painless, and not noticed by the patient or parents. They may be few in number, isolated, or grouped in large numbers. Their size varies from a pin's head to an almond. The skin is movable over them, and they are not firmly attached to the fibrous structures beneath. They have a remarkable tendency to disappear, but sometimes they persist for weeks and months together. So they may come out in successive crops. They may last only three and four days. I have seen these nodules about a wrist joint in which there was well-marked effusion. Generally, however, the joint effusion is absent where these nodules exist. I have no wish to deny that acute rheumatic fever, such as is seen in the young adult, may not have its exact counterpart in a child, though this in my experience is rare ; mania and hyperpyrexia have occurred.

Erythema marginatum and papulatum are unquestionably of rheumatic origin, and of very frequent occurrence in children's rheumatism.

Erythema nodosum is doubtless allied to rheumatism, but heart complication is rare in immediate connection with it.

Urticaria and purpura are sometimes of rheumatic origin. Pericarditis is not uncommon in children's rheumatism. Serous pleurisy is at times of distinctly rheumatic source. Stiff neck and tonsillitis may also be due to rheumatism. Unquestionably chorea is sometimes, but not always, a rheumatic symptom. It is of prime importance to remember that any of the rheumatic phenomena may occur alone, and that any combination of them may be met with. Moreover, they may alternate with one another, and rarely the whole of them may co-exist. Thus hardly any of them can be called sequelæ without allowing also that they may be complications

of the rheumatic attack. Sometimes the attack is long-drawn and straggling, being constructed of a curious succession and combination of symptoms. If one of the symptoms comes first one must be on the *qui vive* for others. In this regard it would not be ridiculous for a doctor to keep a child in bed for urticaria or erythema, even though there were no other sign of illness; for it may be held that the frequent endocarditis and pericarditis of children may be partly, at least, due to the mechanical irritation resulting from the want of rest. In adult rheumatism the joint trouble leads to immobility, and the stress on the heart must be less if exercise cannot be taken.

The rheumatism that sometimes follows and sometimes accompanies scarlet fever may be true rheumatism, but, unlike true rheumatism, suppuration of the serous effusions is frequent.

The basis of a valvular vegetation in endocarditis may be described as a nodule, and Dr. Barlow regards a subcutaneous nodule in rheumatism as homologous with the valvular nodule. Rheumatism is manifested anatomically in discrete lesions, often grouped together. An erythema may be but one minute spot, but usually many red spots develop in close contiguity. So it is with the valvular beadings and the subcutaneous nodules. Nodular forms of rheumatic pericarditis may be seen, and even fibrous nodules on the wall of the heart in cases of rheumatic pericardial adhesions.

The pyrexia of rheumatism is usually slight; the temperature seldom goes beyond 101° F. Occasionally, however, a high fever is registered, but hyperpyrexia is rare. And so are the following cerebral phenomena—delirium, mania, sleeplessness, and unrest—uncommon in children's rheumatism. The heart is almost invariably the seat of a murmur during some part of the rheumatic career. These murmurs frequently are heard a few days after the illness begins. They often dis-

appear altogether. Sometimes the anæmia has caused them; at other times it is possible that the murmur ceases when the valvular nodules (endocarditis) have subsided. It is an error to say that the right side of the heart is not affected in children. Post-mortem examinations not unfrequently reveal beadings on the tricuspid valve. The pericardium and endocardium may inflame without any indications of rheumatism in the limbs. This fact is included in the statement made on p. 123.

The *severity* of children's rheumatism may be measured by the number of nodules. It does not follow that all the rheumatism will not disappear when it is of severe degree. Much of children's rheumatism is smouldering and lingering in its course, and then, I think, the persistence of the nodules is, to a certain extent, a warning and a guide of this. But the rheumatic cause may pass away and still the nodules remain and the heart mischief increase. In this case ought one to suppose that some other irritant than rheumatism is keeping up the nodules ?

The **diagnosis** of rheumatism in children may often be made when there is no true rheumatism. Infantile palsy may be called rheumatism owing to the pains, tenderness, and fever which may announce its onset ; even swelling about the ankle may occur and simulate rheumatism. The rapid development of paralysis with loss of reflex action may soon clear up the case. The Germans have described as rheumatic a slight swelling about the back of the wrist and front of the ankle that may attend the onset of painful tonic spasm of the hands and feet (tetany). The immobility (due to pain—pseudo-paralysis) of limbs, often symmetrical, that is seen in some cases of congenital syphilis about the elbows and wrists, or knees and ankles, may be mistaken for rheumatism ; but the swelling is in and around the end of the shaft of the bone, and not strictly at the joint. Rickets may

be associated with tenderness and swelling of the wrists, but this could hardly be mistaken, nor yet could the scurvy rickets, with its hæmorrhage into the periosteum of the long bones, although this may involve one limb after the other. Hæmophily is attended at times with effusions into joints; these are sometimes hæmorrhages. An insidious acute joint inflammation of a large joint (hip, knee, ankle), that rapidly suppurates, and when evacuated as rapidly heals, is seen in young infants, and this without much fever; the child may die suddenly. Suppurative umbilical phlebitis may be associated therewith. Gout may in a child cause a periarthritic effusion of serous nature, and with a temperature of 102° some pains and slight sweating.*

The **treatment** of rheumatism consists in keeping the child in bed, supplying it with copious bland fluids and administering alkalies and salicylates. The joints may be wrapped up in cotton wool. The skin should be sponged daily, and perspiration, which may be slight (often nothing more than moisture of palms and soles), should be promoted. Salicylates do not do much good unless there is pain, pyrexia, and joint effusion; this is my conclusion; and I prefer the use of alkalies.

℞ Citrate of Potash, gr. vi.
Syr. Aurantii, ʒss.
Aq., ℥ss.

Four times a day to a child five years old.

The urine should be kept alkaline by means of the medicine. If a joint be specially painful, a hot wet compress frequently changed is good treatment, and the salicylates should be employed.

℞ Potas., Carb., gr. v.
Salicylate of Soda, gr. v.
Syr. Aurantii, ʒss.
Aq., ℥ss.

* T. Barlow, "Brit. Med. Jour.," 1883, Vol. ii.

Every three hours for a child five years old. It is seldom necessary to continue this treatment more than 24 hours, and the alkali should be combined with it.

The diet should be purely liquid whilst the fever lasts—milk and barley water, beef tea and mutton broth, thickened with Savory and Moore's food. In convalescence fish may be allowed. Meat and eggs should be interdicted as increasing the rheumatic tendency. The bed must be kept for a week or ten days after the disappearance of all active symptoms. Relapse and recurrence must ever be in the mind of the practitioner when treating rheumatism. The value of cold douches in averting this tendency may be remembered. The best tonic for a convalescent from rheumatism is quinine and iron, the anæmia being often a marked legacy.

℞ Quinine Sulph., gr. ½.
Tinct. Ferri Perchl., ♏iii.
Glyc., ♏xx.
Aq., ʒii. t.d.s.

For a child five years old.

The bowels ought to act once a day; mild laxatives, not powerful purgatives, should be used—fluid magnesia, or Eno's, or Carlsbad.

The **stiff-neck** of rheumatism should be treated in bed, for a day or two at least. Likewise the tonsillitis. Other rheumatic phenomena should be looked for; special attention being paid to the supervention of cardiac inflammation. The debility of chronic rheumatism is best treated by careful hygiene—air, diet, clothing, exercise, and the use of ʒss. of iodide of iron syrup twice or thrice a day.

**Tonsillitis.**—Alkalies, especially bicarbonate of soda, appear to be very valuable. It may be sprayed—gr. x. to ʒi.—on to the throat at frequent intervals during the day. It may be applied externally as compresses, and given internally in five-grain doses three times a day, with infusion of gentian. A

daily full, but not vigorous, action of the bowels may be secured with saline purgatives.

Acute thyroiditis is sometimes a rheumatic phenomenon.

For the treatment of pericarditis and endocarditis see special sections.

*Prevention of complications* is best effected by absolute rest in the recumbent posture, to relieve the heart as much as possible, and by the maintenance of a uniform and even temperature all over the surface, so as to avert a chill. It is advisable to keep the child between the blankets, which require frequently changing ; they should be well aired and warmed before being placed in position.

*Prophylactic and hygienic treatment.*—Rheumatic children should be clothed in flannel or woollen under-clothing. Cold and damp must be avoided. Rheumatic children are generally of neurotic type, often possessed of abundant energy, but this is prone to escape too easily. At times they resist their enemy stoutly, and at others fall an easy prey to fatigue, cold, or damp. A long day in the country for a Sunday School congregation, as Dr. Barlow truly observes, will often pick out the rheumatic children in the direction of swollen ankles and knees.

**Further treatment of Rheumatism.**—*Applications to joints.*—The cotton wool should be bandaged firmly and neatly on the joint. Compresses covered with oil silk are changed every two hours ; they are retained by light bandages. Blisters should not be used. I have seen minute blisterings used over rheumatic nodules. It is difficult to say whether they have any effect on these structures, whose duration is so variable. I have never seen the case that wanted a leech. Meigs and Pepper advise bathing painful joints with sedative liniment of sweet oil (℥i.), chloroform (3i.), tinct. opii (3i.) ; (the quantities of the ingredients are mine). The joint is confined in bats of wool and oil silk, with a bandage to exclude the external air. In chronic cases care should be taken to prevent deformities of joints by correcting bad posture, etc.

*Sweating* should not receive other treatment than careful cleansing of the skin with tepid water, and scrupulous cleanliness of the child's clothes and bed linen.

*Antipyretics.*—Quinine is given in five-grain repeated doses. But tepid sponging, the wet pack, or, as can but rarely be required, the cold bath (see Fevers), are better employed. Antipyrin is sometimes given in acute rheumatism in children. It can be seldom required, for high fever is rare. One boy 12 years old took 90 grains in a single day without inconvenience (Neumann). But its use needs caution.

*Diet and stimulants.*—Stimulants are not to be used unless there be complications, or unless acute dilatation of myocardium set in. Brandy, whisky, or gin may be given in half-dram doses, repeated as often as the condition of the myocardium may suggest. (See Heart Disease.)

*Tonics and hæmatinics.*—Quinine and iron are given in a variety of ways. The tincture of the acetate of iron ♏ xv., t.d.s., for a child of five, is valuable in the subacute varieties, for it acts on the skin and kidneys, promoting the elimination of the materies morbi. Anæmia is a frequent and may be an intense indication for treatment. Fresh warm air is most necessary.

*Opium* is very useful when the pain is bad. Dover's powder gr. iv., or chlorodyne ♏iv., for child of seven. For severe dyspnœa and failing heart there is nothing but free stimulation and opium, with counter-irritation by guarded mustard applications.

*Specific and curative agents.*—*Salicin* (gr. v.), *Salicylate of soda* (gr. x.), t.d.s., given in syrup of orange, child ten years old. Some combine it with a diaphoretic—liquor ammoniæ acetatis 3ss. The salicylates are thus prescribed till fever and pain subside. When these phenomena are present they disappear in three or four days under the salicin treatment. They have not much influence in my experience over the complications (heart and other) of rheumatism, and are far less valuable in the atypical forms of rheumatism which are so common, not only in children, but in adults.

To *quinine* and *arsenic* have also been ascribed a specific action.

*Salicylate of lithia* is prescribed in the same doses as the soda salt. *Acetates* of ammonia and potash are valuable diuretics and diaphoretics to eliminate poison.

*Iodide of potassium* is most suitable for atypical and chronic varieties of rheumatism. The isolated attacks of rheumatic torticollis and tonsillitis may also be treated by specific substances.

Several cases of nocturnal incontinence of urine in rheumatic girls and boys appear to have been benefited by a combination of alkalies, salicylates, belladonna, and nux vomica.

**Chronic rheumatic arthritis, or rheumatic gout.**—This disease may be seen in children; it may follow an attack of acute rheumatism; it affects both feet and both hands; and resembles the multiple joint affection of middle-aged women rather than the arthritis sicca of the old. The heart is not usually affected. The propensity to deformities and anchylosis in awkward positions is rather great, but varies in different cases. The treatment adopted should be the same as for the adult—Turkish baths or hot-air baths, iodide of potassium and quinine, with or without iron.

℞ Potassii iodidi, gr. iii.
Spt. Am. Arom., ♏x.
Aq. Chlorof., ʒii. t.d.s.

Great care must be taken in the avoidance of cold, damp and over-exertion. Cleanliness of the skin, fresh air, suitable clothing, and exercise are important. The diet should be liberal, though nothing but indigestible articles need be avoided. Beer and wine should not be allowed. The pains may be relieved by the introduction of ♏x. of Tinct. Acteæ Racem. into the iodide mixture. At least, in some cases, this seemed to lessen the pains. Too much importance cannot be attached to the value of exercise in all patients prone to rheumatism. The inspirations and expirations are rendered more efficient, the skin and kidneys and liver act better, and are better supplied with blood, so that excretion of fatigue products and the metabolism of the various food substances is rendered more efficient. Overwork, especially of the brain, should be prohibited.

**Ague.**—Ague is a rare disease in children in this country. When it occurs in children under the age of four years its symptoms are much less marked than at older ages. The initial chill is frequently slight, is hardly ever attended with a rigor, but sometimes a convulsion occurs. There sometimes may be mere drowsiness or more marked stupor. The

sweating stage is also ill-defined, as sweating stages are apt to be in any infantile disease; see remarks on phthisis and tuberculosis. The hot stage usually lasts six or eight hours; it is well marked, and attended with a great increase in the discharge of urea and chloride of sodium by the urine and a diminution of the phosphates. The crisis is not a marked feature. The intervals between paroxysms are often attended with many nervous symptoms: malaise, headache, drowsiness, or unwonted cheerfulness.

An enlarged spleen, anæmia and melanæmia may result from repeated attacks, and a malarial cachexia may develop.

The diagnosis is often difficult, owing to the indefiniteness of the attacks. Scarlatiniform rashes have been noticed in the febrile period.

Repeated attacks of ague tend to paralyse the portal circulation and the portal viscera: this produces a large tender liver and spleen, with tendency to piles and bleeding.

A large tender liver and spleen, with a sallow complexion, are contra-indications to the use of quinine. A few doses of gray powder and a saline purge (Eno's or Carlsbad, or sulphate of soda) should be ordered. When the tongue becomes clean, and the visceral enlargements have subsided, then is the time for quinine.

The *treatment* of an attack should be that of ordinary fever. The wet pack may be used if necessary. The food should be liquid, bland, and abundant. Thin barley water, sweetened and flavoured, does well. Hot-air baths may relieve the hot skin. Quinine should be given in full doses, gr. v., for a child of five, and repeated if required. It may be floated on the surface of milk, swallowed in gelatin capsule, put into the rectum in a suppository; or it may be disguised in glycerine and milk. Tannate of quinine may be used in quarter-grain doses under the skin; the solution and syringe should be warmed before being used.

As in adult therapeutics, the quinine should be administered in the intervals between the attacks; if the exact time of onset can be predicted, a large dose may be given two hours before the expected paroxysm.

Liq. Arsenic is valuable in the indefinite malarial symptoms. It may be given with steel wine or alone with syrup of orange or lemon, or glycerine. It may be taken with syrup of lactophosphate of lime and iron.

Nitrate of pilocarpin in sweating doses is said to have the power of cutting short and also of preventing aguish attacks.

## CHAPTER VI.

### GANGRENE.

THERE is no essential difference between gangrene in children and adults. The inherent vitality and better quality of infantile tissues make no appreciable difference when an adequate cause of necrosis is present. If gangrene occur in Raynaud's disease, the parts should be kept warm, and the slough allowed to separate at the line of demarcation. Sometimes the gangrene spreads a little beyond the bounds of its first limits; it is usually a dry gangrene. Good nourishing food, meats, eggs, and wine should be given. Sometimes Raynaud's disease is very severe (see a case by R. Southey, "Clin. Soc. Trans.," Vol. xvi.).

Gangrene is apt to occur after scarlatina, variola, varicella, enteric fever, and especially measles. Sometimes embolism is a cause of it. Gangrene of the vulva may be associated with hæmaturia, cardiac thrombosis, and embolism of the cerebral arteries. Gangrene of the vulva is fairly common. Male infants may suffer from gangrene of the scrotum. The symptoms, pathology, and treatment are nearly the same as in adults. If the gangrene be of the dry kind the hot application should also be dry: bags of sand or bran. Cold must be avoided, and the diseased parts kept sweet; powdered iodoform blown on with Mayer and Meltzer's insufflator is very useful. The parts may be washed with chlorine water. Hot fomentations of boracic lint or poultices may be used to stimulate the separation of the sloughs. Sometimes the sloughing action may be arrested by the application of strong nitric acid over the whole extent of the necrosed part. Plenty

of nourishment, in keeping with the child's powers of digestion, should be given. Meat, eggs, malted foods, beef-tea, and wine may be ordered. Tonics of quinine and iron, or of sal volatile and cinchona, may be given also.

℞ Quinæ Sulph., gr. ½.
Tinct. Ferri Perchl., ♏iii.
Glyc., ♏xx.
Aq., ʒii. t.d.s.

℞ Spt. Ammon. Arom., ♏xv.
Liq. Ext. Cinch., ♏iii.
Inf. Cinch., ad ʒii. t.d.s.

For a child five years old.

Some advise the employment of large doses of quinine, gr. ii., three times a day for a child three years old. Opium is very valuable for relieving pain and promoting sleep. These symptoms are not always urgent. It must be given cautiously, drop doses of chlorodyne every half-hour, because the kidneys are likely to be inefficient and the urine albuminous in these diseases.

**Gangrene of the lung** cannot be diagnosed with certainty. It may complicate gangrene of the gums, pharynx or gullet, and its general causation is the same as that of gangrene of the vulva and other parts. The treatment should consist in the supply of nourishment and stimulants, care being taken that enough and no more is given. The vitality is not maintained if the digestive system be overloaded. The amount of air passing through the sick chamber should be at least twice as great as for any other disease. The horrible fœtor of the air necessitates this both for the child's own sake and for that of his nurse. The stench must be overcome by the free use of antiseptics about the room. The furniture should be of the most scanty description, perfectly smooth and washable. A chip box with crystals of iodine

therein, and basins of Condy's fluid, may do something to relieve the room of the odour of gangrene. The carbolic spray may be allowed to play into the room to keep down the stench. Besides keeping the apartment sweet, topical applications should be made in the form of inhalations of turpentine and terebene, carbolic acid (each ʒii. to Oi. of boiling water), or the apparatus used in chronic bronchitis may be employed. These inhalations should be frequently repeated, without, however, fatiguing the child. Not only is the fœtor attacked at its escape from the lungs and when in the room, but antiseptics are given internally—with but little effect I think. Salicylate and benzoate of soda and naphthalin in five-grain doses every four hours, are perhaps the best; or the sulpho-carbolate of soda may be given in five-grain doses three times a day; glycerine of carbolic acid or creasote in two-minim doses three times a day. The doses are for a child five years old.

Tonics as well as stimulants are given to support the strength and reduce the temperature. There may sometimes be a low temperature. The best preparation is dram doses of sound brandy as frequently repeated as necessary, for a child five years old, and given in water. Constipation is best relieved by castor oil, and diarrhœa by naphthalin and small doses of opium, provided there is no contra-indication to opium in the form of difficult respiration, feeble cough, or great engorgement of the venous system.

**Cancrum oris.**—This is a form of gangrenous disease; it is prone to occur in debilitated children after measles, and especially amongst the poor who live in unhygienic surroundings with a vitiated atmosphere and unsuitable food. It may be associated with gangrene of the vulva, scrotum, or lungs. The chief symptoms are those of excessive *asthenia* with *gangrenous* odour of breath, the salivation, and difficulty of eating and swallowing. There appears to be singularly little

suffering, perhaps from the *apathy* of the child. The ulceration commences as a whitish or greyish area in the mucous membrane of the cheek, which is indurated at this spot. The induration and sloughing spread with varying rapidity, and may lead to perforation of the cheek with necrosis of the jaw. As there is but little pain, and little cerebral action (apathy), so there is but little fever; perhaps from identical causes—the poison depressing the algogenic, thermogenic, and other cerebral centres.

The child must not only be prevented from breathing the septic atmosphere. He must also be prevented from swallowing the excretions from the slough. Minute particles, not volatile, may find their way direct into the respiratory passages. Posture may do something to avert these accidents; the child should be kept in the prone position on its belly, with the bad side dependent and the head over a bolster.

Tracheotomy has been performed with the same object in view; it was not successful, but the idea is a good one; it is done for the same reason as in operations on the tongue and palate.

The gangrene sometimes does not involve the cheek, but the gum or the region between the two. The usual termination is led up to by progressive increase in anæmia and asthenia, increasing drowsiness, diarrhœa, and frequently anasarca. The appetite may survive in a remarkable fashion. *Septicæmia* or *pyæmia*, with abscesses, may supervene, or lung consolidations of lobar or lobular kind. As a rule the case lasts a week or two weeks. A fatal termination does not always occur. The induration and mode of spread, and the circumstances under which the disease arises, preclude any difficulty in diagnosis. The chief weapons at our disposal in its treatment are the usual hygienic ones. The child must be brought out of darkness into light; from poverty to wealth, or its equivalent; from filth and filthy air to cleanliness and

purity of atmosphere; from bad and insufficient feeding to a judiciously stimulating and nourishing dietary of raw meat, eggs, milk, fresh lemon juice, and strong beef tea, with port wine or brandy. The nasal tube and rectum may be used for purposes of alimentation. The child cannot have too much fresh air, but he can have more than enough of fresh and good food. The feeding must be left to a skilled nurse and doctor, small doses and frequently, after the plan of treatment of all very exhausting illnesses. The use of plenty of deodorants and disinfectants about the room (see Gangrene of Lung) is advisable. *The prevention of local and general sepsis* is the principle always to be held in view. The bowels and skin must be carefully attended to. The former may be kept acting once a day by a dose of castor oil or rhubarb and soda; and the latter needs not only cleansing, but careful protection from chills. The surgeon usually makes one thorough application of Nordhausen fuming nitric acid on a stick to the whole of the diseased surface. *The object is to destroy the virus of the disease.* If the child has any vitality to speak of, this usually arrests ulceration. Some prefer the actual cautery or galvano-cautery. The mouth should be thoroughly rinsed and syringed out with some alkali (carbonate of soda gr. x. to ʒii. warm water) after the acid has been applied. It is important to check the fœtor at its source, and to prevent septic bronchitis, pneumonia, and pyæmia; this may be done by sprays of Sanitas, syringings with Condy's fluid, or chlorinated soda solution, 1 in 10 of water, and by powdering the surface of the gangrenous part with iodoform. Hot boracic fomentations may also be applied to the part to aid the separation of the slough. It is useless to order medicines until there is some chance that the case will not terminate fatally in a few days. When chronicity has become established, quinine—sulphate, or tannate, or citrate—in one-grain doses, for a child three years old, may

be prescribed in red currant jelly or glycerine and water. Iron may be given with it, preferably in the form of the tincture of the perchloride ♏v. and sulphate of quinine gr. i.

Goodhart regards cancrum oris as if it were charbon or malignant pustule, and bids its excision if the case be seen early enough.

**Further treatment of gangrene.**—A solution of carbolic acid 1 in 20 may be employed as an antiseptic and stimulant to the sloughy surface.

To remove the offensive odour a gaseous oxygen bath is recommended, and this may be given in the form of the vapour cone of the North Hants Chemical Company, the gas being confined within limits by means of a box. The gas is said to relieve pain and check the course of the gangrene.

An ointment of balsam of Peru ℥i. to ℥ss. vaseline is a good stimulant and antiseptic to gangrenous sores. Solutions of chlorate of potash gr. x. to ℥i. are used, especially in cancrum oris, for which disease three or four grains may also be given internally. Dusting the part with powdered animal charcoal acts antiseptically, and also as a stimulant. Wet charcoal poultices are voted useless. A lotion of quinine (gr. v. to ℥i. or stronger) has also been used to gangrenous sores. Salicylic acid has been blown on to gangrenous sores with good effect. Boracic acid lotion gr. xx. to ℥i. is a good antiseptic.

In cancrum oris strong hydrochloric acid, the acid nitrate of mercury, the liquor ferri perchloridi and nitrate of silver, gr. xxx. ad. ℥i., have been used instead of fuming nitric acid. Lewis Smith recommends sulphate of copper half-a-dram, and powdered cinchona half-an-ounce, in four ounces of water. Terebene and eucalyptol are also useful antiseptics, and may be mopped on the surface of the sore.

## CHAPTER VII.

### THE RESPIRATORY SYSTEM.

**Peculiarities of anatomy and physiology.**—The *epiglottis* is of a peculiar shape in infants; it is folded on itself like a leaf on its mid-rib. The upper opening of the larynx in the infant is therefore of different shape and size as compared with the adult. In the infant it is an oblong slit, in striking contrast with the somewhat triangular outline of the upper opening of the adult larynx. The importance of this shape of the epiglottis is that it makes the entrance to the lungs very small; and therefore renders obstruction to the entrance of air to the lungs an easier matter in the infant than in the adult.

The absolute narrowness of the trachea and bronchial tubes, and the softness of their walls, makes it easy for inflammatory conditions to cause diminution of their calibre, and thus facilitates the production of obstruction to the passage of air to the alveoli of the lungs.

The plain muscular tissue in the lungs, and the elastic tissues, are probably in great perfection in early life, and this may have something to say in explaining the ease with which collapse of the pulmonary lobules occurs. Certainly the general narrowness of the respiratory channels will help to explain why it is that any inflammatory condition of the respiratory mucous membrane can so easily bring about pulmonary collapse. The chest walls of children are also remarkable for their softness and resiliency, forming a striking contrast with the rigid chest of senility. This character of the chest wall, and the narrowness of the respiratory passages, with its in-

evitable tendencies, will serve to elucidate the occurrence of deformities of the chest as well as to explain the liability to collapse of lung. For there is a connection of the "vicious-circle" nature between these anatomical and physiological conditions. The whole matter turns on the difficulty of getting air into the pulmonary alveoli; everything seems to be opposed to the full insufflation of the pulmonary air-cells during inspiration. The feebleness of the respiratory nervous centres and muscles of infants also tells in the same direction. A slight inflammation anywhere in the respiratory passages is sufficient in the infant to cause enough obstruction to bring about a recession of some part of the chest walls, and to lead to a partial collapse of lung parenchyma.

The small calibre of the respiratory tubes, the softness of the thoracic walls, the feebleness of the respiratory muscles, all tend in the same direction, and are all concerned in giving to the respiratory diseases of children some of the peculiarities they possess.

It should be borne in mind that these peculiarities are always most marked in that period which may most properly be called the infantile—the first two years of extra-uterine existence; and they are of course most evident during the first part of this period.

*Collapse of pulmonary lobules and broncho-pneumonia* occur with such frequency in children that special reasons undoubtedly exist for this peculiarity, and, indeed, the majority of these reasons are not far to seek. Atelectasis, or physiological collapse of lung, is the usual state of the lungs in the intra-uterine period. It is reasonable to suppose that the causes which produce this condition of atelectasis would be in operation at the time of birth, and would continue to be in operation with decreasing efficiency as the distance from birth became greater and greater. Naturally the causes of atelectasis are overcome at the moment intra-uterine exis-

tence ceases, and the first breath is drawn, but that fact does not weaken the force of the argument implied in previous considerations. There is a tendency then to a reversion to the atelectatic condition, and this tendency, together with the infantile peculiarities in the anatomy and physiology of the respiratory system already referred to, give us some clue to the reasons for the frequency of occurrence of collapse and broncho-pneumonia in children.

The anatomical and physiological peculiarities of the respiratory organs of infancy aid us in understanding still more of the diseases which the young are specially prone to develop. Deformities of the thorax are liable to occur with great frequency in children owing to the operation of the same causes as determine the frequency of occurrence of collapse and broncho-pneumonia in young subjects. Bronchitis is a very common disease of children, and combined with rickets has a considerable share in the development of thoracic deformities. Indeed, the importance of rickets in the pathology of respiratory diseases and thoracic deformities is so great that special attention must be given to the conditions that are accompaniments of the rickety state.

Rickets increases the liability to recession of the chest walls because it makes the thoracic parietes of even greater softness than obtains in healthy infants. Again, as it weakens all the functions of the body and causes corresponding alterations in the physical condition of the tissues, it follows that the muscles of respiration must also become weaker and less efficient. Further, the distension of the belly, which is dependent on gaseous accumulation and paralysis of the muscular coats of the bowels, encroaches on the already cramped thoracic space, and thus further diminishes the respiratory powers, this diminution bearing in its train further ill-effects.

In order to understand, as far as possible, how the

anatomical and physiological peculiarities of the respiratory system of children, and especially of rickety ones, are responsible for the peculiarities of their respiratory affections, it will be necessary to regard the matter from another point of view. The accusation against the respiratory channels of children, that they are too narrow, is supported by the circumstance that any morbid condition of the walls of the breathing tubes is usually attended by a falling in of some part or parts of the thoracic walls. A slight inflammation of the larynx in children is very dangerous, not only from the greater liability, as compared with adults, to the occurrence of fatal spasm of the laryngeal muscles, but also from the ease with which mechanical obstruction, as from œdema, may be brought about. The recession of the chest walls which is the invariable accompaniment of any obstruction in any part of the respiratory passages is the most active agency in the development of the common deformities of the chest.

**The deformities of the chest** in children much more frequently cause a diminution in the capacity than an increase in the dimensions of the thorax. The shape and size of the thorax in children differ from the shape and size in the adult; for in place of the elliptical outline of the transverse section of the chest wall in the adult we have a circular boundary; the increase of size in the grown up is due naturally to a general growth in most of the dimensions of the thoracic cavity. There are plenty of opportunities of examining small chests, both of the *alar* or *winged* varieties, and of the *flat* description in children; whilst most of the deformities of the chest are met with in perfection in the practice of diseases of children.

The *transversely constricted* thorax may be described as one in which the lower sides and lower front of the chest walls are depressed, and may be contrasted with the *pigeon*

*breast*, in which the upper ribs are driven in and the upper part of the sternum arched forwards owing to the fixed insertion of the true ribs into the sternum. In the transversely constricted form which affects the *false* ribs, whose anterior ends are not fixed, the region of the chest involved in the deformity is able to undergo depression during inspiration when any obstruction to breathing occurs. This constriction or groove marks the upper boundary of the liver during childhood.

The reasons for the production of a pigeon breast in one case, and of a transversely constricted chest in another case of chronic obstruction to the entrance of air into the lungs, have never been fully explained. How it is that one case of whooping cough should result in a pigeon breast, and another in a transversely constricted shape of thorax is not known, even though one may be daily witnessing that particular kind of recession of the walls which leads up to the characteristic deformity. The *rickety thorax* differs from both the preceding in that the groove extends throughout the whole length of the ribs, along the distal parts of the true and false ribs, behind the junction of the cartilages with the bones. The grooving is most marked in the middle ribs (5, 6, 7), in those ribs which also exhibit the earliest and most pronounced signs of "beading." The rickety chest is too flat, and a transverse section is very peculiar. The globular shape of the distended abdomen in rickets makes with the chest an outline that strongly suggests a "fiddle." Sometimes in infants a curious deformity occupies the region chiefly of the lower part of the sternum. The deformity has a likeness to a *saucer* or shallow *basin;* it is also termed the *anteriorly-depressed.* I have known this deformity to be produced by long continued bronchitis, and it also occurs as a congenital condition. The inspiratory effort that sometimes gives rise to it seems to be the effect of a strong

dragging backwards of the diaphragm inserted into this portion of the chest wall.

The **pharyngeal cavity** in children is proportionately smaller than in adults, and the lymphoid tissues in this situation are prone to be active and undergo considerable swelling, so that adenoid growths project from all parts of the wall of the pharynx. I have known one case operated on in the supposition that it was one of retro-pharyngeal abscess. The tonsils may participate, and become so large that the obstruction to the passage of air through the posterior nares is exceedingly great, and often leads to the development of the transversely constricted chest, and less often to the genuine pigeon breast.

Deformities of the palate and nasopharynx are very frequent. Nature, like a builder, frequently slurs her work—not without cause—and leaves about more or less formative material, so much mortar, of lymphoid tissue.

The thorax in children not only undergoes more or less permanent changes in size and shape, but also shows very easily alterations of a more transitory kind as the result of acute diseases. There is no occasion to describe these changes more fully, for beyond the fact that the alterations are produced with greater facility owing to the yielding characters of the walls, there is nothing calling for special comment. It may suffice to say that the commonest form of marked unilateral enlargement of the chest in children is that common disease of the young—empyema.

It is a cardinal feature of the respiratory movements of male and female children that the breathing is effected far more by the diaphragm than by the intercostal muscles.

The rate of respiration in infants is more rapid than in adults, and the rhythm is most variable and irregular during waking hours. During sleep, the only time that ought to be used for accurate observation, the rate under one month is about forty, under two years thirty, under ten years twenty.

*Expiratory respiration* is so named when the pause occurs just before expiration which is often "panting."

The weakness and high pitch of the voice renders the vocal fremitus of less value in children than in adults, but if this method can be employed the indications in the differential diagnosis between solid and fluid conditions within the chest, are more reliable than those derived from auscultation. The "cry" fremitus often proves of service in physical examination.

The physical examination of the respiratory organs in children is best conducted in the same general fashion as in the examination of adults. But the indications to be derived from the examination are not of the same value or order. There is greater variability of the physical signs in the young, and this circumstance makes a careful examination more necessary than in the adult. For instance percussion may yield a dull note in some part of the chest, and yet other methods of physical examination fail to show that there is any abnormal condition, and indeed the dull note may not be obtained on re-examination some time later. The "cracked pot" sound, too, occurs with great readiness in the percussion of yielding parts of the chests of infants; it has no pathological significance unless accompanied by other physical signs indicative of a cavity. But a very dull note with an increase in the resistance as felt by the percussed finger is a very reliable sign of disease. If the resistance is very great, and the note almost toneless (American-flatness), the percussion alone should strongly suggest the presence of fluid in the pleura.

The normal breath-sounds in children are widely different from the respiratory murmur of adults. No one has yet given an adequate explanation of the loudness of puerile respiration; the inspiration is accompanied with a much louder and generally higher pitched murmur audible all over

the surface of the chest; the expiratory sound is also usually more audible than it is in the adult. It is well worth considering whether the narrowness of the air passages which is a feature of t. e anatomy of the respiratory organs of children may not be at least a partial reason for the louder and higher pitched characters of the infantile respiratory murmur.

It is necessary that the practitioner should be aware of certain facts relating to the signs yielded by percussion of the chest in children: the note obtained from percussion of the left infraclavicular region is normally less resonant than that evoked by striking the right infraclavicular region. This difference obtains throughout life, but the difference is greater in children and women than in the adult male. I make special mention of this circumstance, because I have known the notion of enlarged mediastinal glands to be entertained on no stronger grounds than a slight difference in the quality of the percussion note at the two sides of the manubrium.

Auscultation is of far less value in diagnosing morbid conditions of the lungs of children as compared with the value of the same method of examination in adults. In the diagnosis of consolidations and fluid effusions into the pleura auscultation need not be practised at all, for a solid state of lung may not unfrequently give the auscultatory signs of fluid effusions as we know them in the adult; and, on the other hand, more frequently a pleuritic effusion will manifest auscultatory signs utterly indistinguishable from those usually regarded as due to solid conditions of the lung.

The above considerations will be sufficient to explain why it is that the use of an *exploring syringe* should be frequent in the practice of diseases of the respiratory organs of children. The syringe should be employed with the same object that percussion and auscultation are cultivated—as a means of diagnosis. I have never seen any danger or un-

toward accident arise as the result of the use of the exploring syringe. A little emphysema of the subcutaneous tissues I have occasionally witnessed after the introduction of the needle, but even this trifling accident may usually be avoided if the introduction and withdrawal of the syringe be accomplished with dexterity.

*Expectoration.*—The act of hawking as well as that of coughing is necessary for the proper ejectment of the bronchial secretions. The secretions from the inflamed surface of the respiratory passages in children are practically the same as those from the same parts of the adult; but we are accustomed to say that children do not expectorate their bronchial secretions. This statement holds good for children as a rule under the age of seven, though there is no reason that prevents any child from expectorating its secretions beyond the inability to hawk efficiently. Infants mostly swallow the mucus and mucopus which the ciliary action, and still more the act of coughing, bring into the grasp of the pharynx. Nevertheless, whenever the quantity of secretions brought into the pharyngeal cavity is very large, some of it not unfrequently escapes by way of the mouth and nose, and this may happen with a child of any age. It should be remembered that the act of hawking, like that of properly blowing the nose, is acquired with greater facility by some children than others. Mental deficiency and nasopharyngeal imperfections often go together; either may be a cause of difficulty in learning to speak, hawk and blow the nose.

## ENLARGED MEDIASTINAL GLANDS.

The diagnosis of enlarged mediastinal glands is often made, and, as I have occasion to know, not unfrequently erroneously. It is impossible to be absolutely certain of the *absence* of enlarged mediastinal glands. When the tumour in the mediastinum is of such dimensions as to

cause a great number of symptoms of compression of thoracic structures—which is not often the case—a fairly safe diagnosis may be made. In the absence of such a combination of symptoms, however, there is a certain conjunction of signs which may give good grounds for believing in the existence of large mediastinal glands. These are marked dulness in the manubrial region or the corresponding interscapular space behind; the presence of abnormally distinct bronchial breathing over or about the dull areas; the existence of loud venous hums, systolic murmurs, or accentuated cardiac sounds about the same places. Most of these signs are increased by strongly retracting the head. Doubt no longer hangs around the notion that large glands pressing on the pneumogastric is *a* cause of the peculiar kind of coughing that is most frequently heard in hooping cough. Spasm of the larynx is set down also to enlarged tracheal and mediastinal glands.

## THE TREATMENT OF CATARRH.

Children of all ages and both sexes suffer from catarrh of the nasal and pharyngeal passages, but neither do the symptoms nor the pathology differ in any remarkable way from the same affections in the adult. Children more easily take "cold," and the catarrhal affections of the respiratory mucous membranes are, therefore, of greater relative frequency in them; there is a greater liability to the spread of the catarrh from one point of the mucous membrane to another. A closer sympathy seems to exist between allied functions and structures in the young as contrasted with adults; certainly this contrast is merely one of degree, and it may perhaps be better expressed by saying that the chance of a nasal catarrh spreading to the bronchial tubes in children is three or four times as great as in adults.

An ordinary catarrh of the nasal mucous membranes may

also illustrate another general principle in the pathology of children; the temperature of the body of children is more easily disturbed by any acute affection than is the temperature of adults; the disturbance of temperature is also more erratic in the young; it is less subject to the ordinary laws of pyrexia, and prognostications with regard to the course of the body-heat are apt to be sadly out of the reckoning. Usually the fever that attends an uncomplicated case of catarrh of the upper respiratory passages does not rise above 101° of the Fahrenheit scale, but now and again, without obvious reason, the temperature may reach 105°, with a corresponding increase in the severity of the nervous symptoms, drowsiness, convulsions, or delirium being prominent signs. These disturbances are certainly most frequent in neurotic children (q. v.). Whatever the explanation may be, it is certain that these eccentricities are far more often met with in children than the grown-up. It may be that some of these unusual cases are masked forms of measles, measles without the rash; but if so, there is nothing to guide us in diagnosing the cases beyond the fever and attendant nervous phenomena already mentioned. The greater liability of children to suffer from catarrhal affections of the respiratory mucous membrane is partly to be explained, or to be connected in some way, with their greater susceptibility to the deteriorating influences of an unwholesome atmosphere. This unwholesomeness of atmosphere shows itself in many ways: the air may be too cold, too moist, too much charged with inorganic and organic matter, including also various forms of micro-organisms. All these objectionable characters of atmosphere tell with greater severity on the living tissues of the young, whose "vitality" must be placed at a figure considerably below that of manhood, or, indeed, any other period of existence. In order appreciably to lower the vitality of infants, it is merely necessary to keep them in the nursery with the door and

windows sedulously closed for a single day. A ride in the perambulator in cold, moist air would then be amply sufficient to induce a catarrh of some part of the mucous membrane.

**Treatment** depends largely on the cause. The catarrh may be a pure neurosis, as many hold; but frequently, at all events, there is in addition some distinct cause (contagium or special excitant, haypollen, ipecac., etc.) which sets the reflex arrangements of the naso-pharyngo-laryngo-bronchial mucous membrane out of order.

All treatment aims at restoring the reflex mechanism to normal modes of action. Remedies exist for lessening reflex excitability and morbid local irritability, and for arresting secretion. General measures for effecting all three objects: The atmosphere supplied to the infant must be warm, pure and of a certain degree of humidity, about 65 per cent. of saturation. In bad weather the hygienic nursery is, therefore, indicated. In summer and fine weather the infant suffering from catarrh may be out in the perambulator under the shade of the trees, but not in draughty quarters. The uniform atmosphere lessens sneezing, secretion and uncomfortable sensations. Great care is required in scrofulous and rickety infants lest collapse of lung and broncho-pneumonia should supervene by mere spread of inflammation.

The Diet requires but little alteration. Over-feeding is bad; it surcharges the blood, gives the excretory organs more work to do, and probably increases the morbid irritability of the disordered reflex mechanism.

Thirst is relieved by small doses of iced water, orangeade, lemonade, or glycerine to the lips and tongue. The bowels must be evacuated once a day, by a mild laxative, or by gentle irritation of the rectal mucous surface by a tiny piece of soap. Severe purging is bad. It may help to get rid of the poison in the blood, and may lower the reflex activity of the sneezing centres, but it causes catarrh and lowers strength.

Purges should be avoided in rickety and scrofulous infants, because they would aid the spreading tendency of infantile catarrhs. Minute attention to practical details is most necessary in the new-born, whose lungs may collapse almost in the "twinkling of an eye," like a child's elastic air ball. The coexistence of catarrh of the stomach or bowels somewhat modifies diet and treatment. (See special sections.)

**Internal remedies.**—*Sedatives* to lessen reflex activity—opium, bromide, chloral. Dover's powder is excellent for children of all ages; it lessens secretion and lowers reflex activity; the effects of repeated grain doses should be watched; some prefer a large dose, gr. v. or x., for a child of five or ten. The practitioner should be cautious, because bromides may excite large plaques of acneform eruptions in young infants. Chloral is very suitable, but requires careful attention—a grain in syrup or glycerine may be repeated according to circumstances.

*Expectorants* to remove local irritation.—Ipecacuanha wine in minim doses every hour, for an infant a year old. Dover's powder contains ipecacuanha; but I use both; the latter may be combined with liq. am. acet. (See below.)

*To arrest secretion.*—Belladonna is anhidrotic, and should be combined with large doses of diaphoretics. Belladonna dries the throat and nose, lessens the sensitivity of nerves, and in small doses stimulates the chief vasomotor centre. Ten-drop doses may be given to a child two years old.

*Diaphoretics* to lessen secretion by derivation, and to eliminate a supposed poison or cause of catarrh. Some catarrhs may be due to obscure gout or rheumatism, and where diaphoresis does so much good, perhaps these fashionable causes are at work.

℞ Liq. Am. Acet., ♏x.
V. Ipecac., ♏iv.
Aq. Menth. Pip., ad ʒi.

Camphor water or chloroform water may be used. The mixture may be given in milk.

*Counter-irritation* to check catarrh. The skin of the front and back of the neck and thorax may be irritated by liniment of ammonia or turpentine.

*Local measures* to ease morbid sensations, coughing and sneezing. As an anæsthetic to sensory nerves nothing beats painting the mucosa over the turbinate bones, the back of the throat, fauces and epiglottis a few times a day with a ten per cent. solution of hydrochlorate of cocaine. As an antiseptic, syringing the nose with a one per cent. solution of resorcin is as good as any other medicament.

*Protection* from irritation of the atmosphere may be effected by pledgets of wool in each nostril or painting the mucous membrane over with glycerine or vaseline and by cleansing the nostrils from crusts and scabs. Water should not be used, but sweet, or weak carbolic, oil. Chronic forms of rhinitis sometimes begin a long career as an acute catarrh—especially in the rickety and scrofulous.

*To break the habit of catarrh.*—Catarrhs tend to recur in the same individual. General and personal hygiene, proper clothing, invigorating douches, avoidance of over-crowding, cold and wet—are important preventive measures. Massage and exercise in pure air improve the circulation and excretion, and so promote the collective health. Daily douches of cold water are invaluable. The douche does no good, but harm, if reaction does not follow the stimulus or shock. A preparation of the water and the patient may be necessary. The water must not be used too cold when the treatment is commenced. It may be not colder than 80° for feeble folk to start with. The douche may be given in front of the fire or stove. The feet may be immersed in water at 100°. The infant may stand or sit, and a gallon, half-a-gallon, or less, according to the infant's vitality, may

be poured from above over the head, shoulders, and trunk. The effect or shock is greater or less as the height of the pitcher is greater or less above the head. It will be seen that one has the agents completely under control. One can graduate one's therapeutic agents to a nicety. The douche is best given in the morning on removing the patient from bed. The child should be thoroughly warm all over. It is advised, if necessary, to prepare the patient by thorough shampooing of the whole body before the douche (Eustace Smith). I should recommend the massage afterwards, to secure and promote a thorough reaction. A small cup of warm milk may be given to the feeble child before rising, but a breakfast is not advisable, for the shock may stop stomach secretion. In some children two or three hours after breakfast is more suitable, for they are then refreshed, not only by the night's sleep, but by the morning's food ; and reaction would be more ready. Immediately after the douche the child should be rapidly wiped dry all over with a large stout towel sufficient to envelop him. The skin may then be rubbed till it glows. He may go back to his warm bed for a few minutes to ensure perfect reaction. The precautions are not wanted when the reaction is ready and the child fairly vigorous. Harm is being done to that child who feels miserable and wretched and has cold hands and feet *after* a bath.

## RHINITIS.

In scarlet fever and diphtheria the mucous membrane of the nose not unfrequently becomes the seat of an inflammation which shows itself by an ichorous excoriating discharge from the anterior nares; the discharge may be thin and watery, or muco-purulent. The upper lip and nose become infiltrated as the result of the irritation of the discharge ; there is injection of the conjunctiva, and the tears may flow over the eyelids as the result of obstruction of the

lachrymal duct (epiphora). Sometimes a membranous formation of diphtheritic sort may be seen on the mucous membrane of the nose. I have known cases of diphtheria of the region of the posterior nares and contiguous part of the pharynx to give no other local signs than those of a rhinitis. The mucous membrane may swell so much in some cases of rhinitis, whether primary or secondary, that respiration may be impossible through the nasal passages. A snorting or snuffling noise usually attends inspiration. In cases of rhinitis, as in cases of large tonsils, the noise is generally louder and more constant during sleep. In diphtheria and scarlet fever the occurrence of a severe rhinitis, as above described, must be regarded as of serious significance; the nasal inflammation is generally, I believe, of septic origin by local infection rather than a direct extension of the primary disease, *i.e.*, the rhinitis is not strictly diphtheritic or scarlatinal, or only so occasionally. It is certain that cases of membranous rhinitis do occur in which the membrane is strictly limited to the nasal passages. Whether these cases are of specific (diphtheria) or more simple character it is impossible to say; though probably they sometimes partake of the one and sometimes of the other nature. Syphilis and scrofula are the commonest causes of a chronic rhinitis, but repeated attacks of ordinary catarrh lead up to a chronic rhinitis which cannot be regarded as either scrofulous or syphilitic, though its local consequences may not be very different. These chronic diseases spoil all the tissues in their neighbourhood, the bones may become swollen like the softer tissues; necrosis of cartilage and bone may occur; the bridge of the nose may become "squat," or taken quite away; the upper lip and wings of the nose may become infiltrated, ulcerated and scabbed over; this may form a likely focus for the development of erysipelas, which is apt to spread over both cheeks and considerably lower the general health,

thereby keeping up the chronic local disease. A common picture in scrofulous children is compounded of breakings out on the head, eczema of the face and ears, otorrhœa and ophthalmia ; the lymphatic glands of the head and neck are swollen also.

**Treatment.**—The treatment of the chronic forms of rhinitis should be conducted on antiseptic and hygienic principles. The immediate removal of all excreted matter which, being dead, forms a nidus for the development of all sorts of micro-organisms, is an object of the first importance ; this removal should be effected by the use of the camel's-hair brush and sweet oil. When the sores are cleaned of all scabs, antiseptic and " healing " salves should be applied. The nasal douche or syringe should be used twice a day to clear away the thick crust from the nasal passages.

*Antiseptic.*—There are many applications for keeping the nose sweet. I employ the ointment of iodoform twenty to thirty grains to the ounce of vaseline, geoline, or fine lard ; some of this may be placed as far up the nose as possible by a fine soft brush ; or the finely-powdered iodoform may be blown up each nostril every morning. Constant care and attention to the case for a long period is the surest way of effecting an improvement.

*Alterative and astringent.*—The number of topical applications is legion. It is useless to mention them all, but I will say a word in favour of the application of a strong solution of nitrate of silver to the ulcerated and inflamed surfaces.

*General tonics.*—Sea air, the child being as many hours out of doors as possible, with sea bathing and the administration of cod-liver oil, syrup of iodide of iron, or of the hypophosphites, or phosphates and a plain diet of underdone meat, milk, new-laid eggs, with some mashed vegetables and stewed fruit, due allowance being made for size and age and complicating conditions, are the best means to promote a

return to the normal standard of health. Whether phosphates or phosphites are most suitable must be a matter of experiment; alternation of the two tonics is often advantageous.

## DISEASES OF THE LARYNX.

A great deal of unnecessary confusion exists with regard to the nomenclature of diseases of the larynx. This confusion arises, I believe, from a greater attention to words than to facts. The chief fact is that the larynx, especially during the first years of life, is exceedingly liable to attacks of spasm of the constrictors [or, as some will have it, to paralysis of the muscles, with consequent collapse of the larynx] and obstruction to the entrance of air. That spasm may be the only disease of the larynx, and that it may complicate all other diseases of the larynx, are the only propositions necessary for understanding what is known on the subject.

**Laryngismus stridulus.**—This is a name given to an attack of spasm of the larynx when no other condition than the neuro-muscular one is present. Child-crowing, false or spurious croup, spasmodic croup, thymic asthma (of the old authors) are synonyms.

Laryngismus is an affection more frequent during the night, especially in the early hours of the morning; it is most common in infants a few months old, and the male sex suffers more than the female. Infants who are liable to it are very prone to have convulsions, tetany, and "facial irritability," by which is meant a contraction of the facial muscles on percussing the region of the facial nerve as it lies in front of the parotid gland. I think laryngismus must be regarded as a kind of tetany of the laryngeal muscles. As to its connection with rickets, all that I can say is that I have generally seen well-marked beading of the ribs in cases of laryngismus; but it is not so common to see laryngismus in

cases of pronounced rickets occurring about the age of eighteen months. That the causes that lead up to rickets are also those that induce laryngismus cannot be doubted. The disease must be regarded as evidence of an hereditary or acquired neuropathic disposition. That every variety of bad feeding and want of hygiene—want of washing, good clothing, fresh air, and proper regulation of sleep and food, are percentage causes of spasmodic croup is true and just, but that the scrofulous diathesis specially disposes to it requires proof. Tossing a child up in the air has brought on an attack. Various exciting causes have been enumerated, but most of them can hardly be looked upon as more than the "last straw" in the causation; such are the act of swallowing, a draught of cold air, fright and shock. Pressure on the trachea by an enlarged thyroid or by other large glands or retro-pharyngeal abscess may cause laryngeal spasm. The symptom of laryngismus is an obstruction, more or less complete, to the passage of air through the larynx. A typical case begins with complete closure of the glottis. The infant becomes blue in the face, is awakened by the curious sensation of inability to breathe, struggles, grows hot, and frequently breaks out into a sweat; then, or before so many signs of impending suffocation appear, a long-drawn "croup" or "crow" is heard, indicating an obstructed inspiration; the asphyxia lasts a little longer; it may be attended with incipient or fully developed convulsions, and the passage of the urine and fæces, but then terminates, leaving behind it no more discomfort than would attend a single act of partial suffocation however induced. It is noteworthy that neither the cough nor the voice or cry is altered by an act of spasmodic croup. This is important as distinguishing an attack due to, or associated with, slight catarrh. Moreover, there is usually no febrile movement. The tendency for the attacks to be repeated is a marked feature of this nervous affection

of the larynx. The pathology of the affection may be summed up as a state of excessive irritability of the laryngeal neuro-muscular apparatus, but whether central, peripheral or muscular cannot be said, though it may be sometimes chiefly one and sometimes chiefly another. A child may die in an attack of the spasm; probably some cases of "overlaying" own to this causation. The severity and frequency of the fits, the state of the health, and the presence of removable causes determine the prognosis. Traction on the tongue has been practised. A powerful impression on some of the sensory nerves of the chest and neck is the best treatment as it may be the best means of evoking an attack. The induction of vomiting by tickling the fauces, smelling salts, a sudden plunge into the hot bath are useful measures. Lancing the gums, if the teeth prove a source of irritation, may be recommended. Chloroform has proved of service, and tracheotomy has had to be performed. The treatment of the case during the intervals is most important;* attention to the diet and other matters likely to remove the irritable state of the nervous system must be carried out, and this will include everything that comes under the head of good hygiene. Fresh air is of the utmost importance, since nothing fires off the respiratory centre more effectively than a diminution of the oxyhæmoglobin of the blood going to the centre.

## INFLAMMATION OF THE LARYNX.

The larynx of infants may be the seat of *catarrhal, œdematous* and *membranous* inflammation. As to the terms croup and diphtheria, all that it is necessary to know in the present state of knowledge may be thus summed up. Croup is a name for the spasmodic seizure which is liable to occur with any affection of the larynx. But

* It is the treatment of Rickets.

the word croup has another meaning : it signifies membrane in the larynx as contrasted with diphtheria, which means membrane in the pharynx at least, and this regardless of its presence or not in the larynx. Sometimes a distinction has been drawn between croupous and diphtheritic membrane : the former being said to be an exudation only on the surface of the mucous membrane, whilst the latter lies not only on the surface, but sends roots into the substance of the mucous coat. It is needless to say that the question whether all false membranes are of a diphtheritic nature or not is still unsettled. Clinically I think it best to regard as diphtheritic all solid exudations. That other agents than the cause of diphtheria may give rise to an inflammation with a membranous formation is well known—the experimental kind caused by ammonia to wit.

All the forms of laryngitis are very common in children, and the inflammations are apt to prove of the severest kind in them. A low degree of vitality, however induced, of which unfavourable sanitary conditions with exposure to the weather are two of the most powerful causes, is the greatest predisposing cause of laryngitis.

There is nothing very special in the causation of laryngitis of children. Œdematous laryngitis occurs not unfrequently from swallowing hot water imbibed from the spout of the tea-kettle in the homes of the poor. Sufficient œdema of the submucous tissues to cause mechanical obstruction to the passage of air through the larynx is very easily brought about in children. Erysipelas about the nose sometimes travels as far as the epiglottis with fatal result. Measles is usually attended with laryngitis, as the hoarse cry and croupy voice sufficiently prove, even if there be no more alarming symptom. Diphtheria of a severe type is apt to occur a few days or a week after the measles rash ; and no matter how early the case is taken, tracheotomy seems generally powerless in such

cases in which the tendency for the membrane to spread along the trachea and bronchial tubes appears to be very pronounced.

Scarlet fever and typhoid fever may also be complicated in children with membranous laryngitis. The inflammatory swelling of the lymphatic glands of the neck is usually very considerable in children, probably in correspondence with the great activity of the lymphatic circulation and lymphatic tissues of the young. Sloughing of portions of the mucous membrane of the epiglottis and its pharyngeal neighbourhood is not uncommonly seen in the post-mortem room, and may be suspected from the presence of an overpowering stench at the bedside of the sufferer.

The symptoms of laryngitis are the same practically in the child as in the adult; special attention should be paid to the hoarseness of the cry, to the croupy or clangy quality of the cough, and to the occurrence of attacks of shortness of breath of the laryngismus stridulus character; the speechless child indicates the chief source of its misery by grasping the throat at the site of the larynx.

*Diagnosis.*—The diagnosis of diseases of the larynx in the young and especially in the infant, presents very great difficulty. It is not difficult, with the exercise of a little clinical industry in the diphtheria wards, to acquire as much skill in the diagnosis of laryngeal conditions as most physicians possess. The following points should be constantly before the mind: the mode and time of onset of the illness, the state of the body temperature, the presence of any deposit on the fauces or pharynx, the existence of a nasal discharge, the condition of the glands about the angles of the jaw, the presence or absence of albuminuria, and also of epistaxis.

The detection of a deposit even of follicular sort on the tonsil is regarded as the strongest evidence of the membranous nature of the laryngeal disease; albuminuria and epistaxis

also favour the diphtheritic view of the case ; a slow mode of onset with gradually-developing signs of weakness, accompanied by inability to swallow without discomfort and considerable hardness of the cervical glands, also point to membrane in the larynx. Remember that general symptoms, such as languor, distaste for food and play without any sign pointing to the throat, may sometimes be the only early indications of diphtheria or pharyngitis of any kind.

A history of diphtheria in the house or neighbourhood from which the child comes is of course of some value in the diagnosis. Lastly, the majority of cases of continued laryngeal obstruction in infants under two years are in my experience of a membranous nature. Catarrhal laryngitis seldom causes the prolonged and frequent attacks of dyspnœa which is the lot of membranous laryngitis ; in young infants of a few months the danger of suffocation from severe catarrhal inflammation is so great that I am disposed to have tracheotomy performed if hot baths, hot flannels to the neck, the steam spray in the tent bed, an emetic and a purge have failed to ward off the attacks of spasm of the larynx which seem every few minutes to threaten the life of the infant.

*Indications for tracheotomy.*—The indications for tracheotomy are simple and plain even to ugliness. If there be signs of increasing obstruction to the entry of air into the lungs shown in the white face with blue lips, and still more in the weak voice and increasing recession of the walls of the chest, the knife may have to be used, regardless of the supposed nature of the laryngeal obstruction. My experience is decidedly in favour of early tracheotomy ; to wait till death's door is reached before tracheotomy is performed as a *dernier ressort* seems to me the very essence of bad doctoring. No reservation should be made from the point of view of the age of the patient, although some parents think death preferable to surgery.

The presence of membrane (very difficult if not impossible to diagnose) in the bronchi should be no bar to the operation. Such cases will in young children be almost inevitably fatal. Tracheotomy is simply done to stop one source of obstruction to blood oxygenation.

Pneumonia and other general diseases (scarlet fever, measles, and pertussis) likewise make no difference in the indications for tracheotomy. They lessen the chances of recovery, but do not contra-indicate operation. With all deference, I hold the same argument when diphtheria is more deadly and extensive.

In my experience tracheotomy early performed and properly managed has saved many lives. The after management of cases of tracheotomy is an important matter, requiring sound surgery and the careful attention of a skilled nurse. I prefer the use of a silver tube at first, and an india-rubber one as soon after as possible. I think it highly desirable that the tube should be removed as soon as possible, and this may at times be accomplished in a day or two. Even removal for a few hours at a time should be practised. I cannot but think that the tnbe is an indispensable *bête noire*, to be got rid of at the earliest possible date. The presence of the tube has at times seemed to me to increase the rate of spread of the membranous inflammation to the bronchial tubes. There is another reason for the discontinuance of the tube at the earliest period possible. After the child has become accustomed to breathe through the tube it seems as though the act of breathing through the natural passages falls into desuetude; so that on the temporary removal of the tube respiration looks impossible and suffocation seems imminent. This condition happens usually when the tube has been worn for a few weeks at least. The difficulty of removing the tube is no doubt a great one. It should be attacked energetically; by which is meant that the tube should be removed whilst the surgeon

sits beside the child, who should be encouraged to persevere in the trial to breathe through the natural passages; this ruse sometimes succeeds when the case had been thought to be hopeless. In some cases the removal is not possible until the child has grown somewhat, and the general calibre of the respiratory passages has increased as the result of the natural, though in these cases slow, development of the body. The impediments to the withdrawal of the tube are numerous. Sometimes the affair seems to be one of pure apprehensiveness on the part of the child; sometimes the tube seems to have set up certain local conditions which prevent the normal acts of respiration. Such are paralysis of the laryngeal muscles, induced either by local changes in the laryngeal tissues or by the actual extension of mischief to the nerves supplying the vocal and respiratory apparatus; not unfrequently small polypi or masses of chronic granulations form the mechanical obstruction; or the vocal cords may become adherent. For the treatment of these conditions, surgical works should be consulted. Intubation is still on its trial.*

The **treatment** of Catarrhal Croup or Laryngitis Stridula.—Although no age is exempt from catarrhal croup, yet it is specially prone to occur in children from the age of two to seven. The pure neurosal laryngismus stridulus is most frequent before the age of two years. The treatment resembles so closely that for laryngeal diphtheria that the two may be considered together. The child is often in bed when the disease sets in, because it occurs at night time and suddenly, almost without warning. The cot should have a tent erected around it, and the *bronchitis kettle* should be set going, so that the air within the artfully-ventilated tent may be rendered warm and moist. It is a great advantage to use the carbolic spray—one part of 1 in 20 carbolic solution to

* The works of O'Dwyer, Waxham, and Lennox Browne may be consulted.

four parts of water. The vapour of carbolic acid reaches the larynx, and exercises a beneficial anæsthetic effect. Sprays of sulphurous acid and five per cent. solution of tannin have been employed.

*Emetics.*—It is well in all cases of sudden laryngeal obstruction to make the child vomit by giving repeated half-grain doses of sulphate of copper in a tablespoonful of warm water.

Tickling the back of the throat with a feather or finger increases the emetic effect.

Teaspoonful doses of alum or ipecacuanha, as in membranous diphtheria, are strongly advised by Meigs and Pepper, given in syrup or honey, and repeated every ten minutes.

If the child can be got to take it, say if he is five years old, two teaspoonfuls of *mustard*, in hot water, does very well.

Tartar *emetic*, as an emetic, is now discarded by most authorities in true croup. The *yellow sulphate of mercury*, in repeated 3-grain doses, is prized by some. I do not think the copper has any especial action on the larynx, and ten grains of *zinc sulphate*, followed by a second dose of five grains, will answer equally well. These doses for a child three to four years old. Emesis lessens the spasmodic element as well as removes foreign matter from the respiratory passages. A hot *bath*, at the temperature of the body, for ten to twenty minutes, also abates spasm, and may be ordered in catarrhal croup. Repeated sweating doses (gr. $\frac{1}{12}$ for an infant) of nitrate of pilocarpin may be useful.

*Purgatives.*—Like asthma, this spasmodic catarrhal croup is often apparently caused by a loaded state of the primæ viæ, and there is nothing more necessary in the treatment than a sharp mercurial purge. Some practitioners object to the mercurial, but in this single dose it is most beneficial. The calomel may be put on the back of the tongue, and a saline (fluid magnesia ʒi.) may follow.

℞ Calomel, gr. ii.
Pulv. Scam. Co., gr. vii.

for a child three years old; or, ℞ Calomel gr. ii., and Jalapine

gr. ii., may be put on the back of the tongue, and washed down. *Mercury*, in repeated doses, should never be used.

**Local Applications.**—*Revulsives.*—Another valuable agent for abating acute laryngeal obstruction is a piece of spongiopiline, on which, a little before its application to the front of the throat, boiling water has been poured; or a sponge, with very hot water, may be used instead; it does not matter much even if slight vesication should follow its application to the front of the neck. Indeed, actual scalding is recommended by some practitioners, but the water need not be so hot. A leech may do good if applied to the manubrium or over the larynx. The mustard foot-bath, or sinapisms to the back or front of the neck, may be used. Emetics and hot baths are more effectual in urgent cases. Cold wet compresses of lint under oil silk, are preferred by some to hot applications, both in simple laryngitis without spasm and without bronchitis. They are, at least, as good as hot fomentations. A mere pad of cotton wool is sufficient in slight cases.

A mustard bath for the whole body is a powerful revulsive, should the simple hot bath fail; it depresses the circulation, causes sweating, lowers inflammation and is anti-spasmodic. Blisters are sometimes applied to the neck to relieve the spasmodic obstruction, but hot water on a sponge is preferable.

It is very essential to remove the spasmodic obstruction as soon as possible, for the oftener it is repeated the more the habit of spasmodic croup becomes established; it seems to be almost as much a neurosis as laryngismus stridulus.

*Diaphoresis.*—When the spasm has passed away a diaphoretic mixture may be ordered every four hours, chiefly with a view to purify the blood.

On the same principle alkalies and iodide of potash may effect benefit. Two grains of carbonate and one grain of iodide of potash may be given with ten drops of syrup of tolu.

*Cough.*—If the cough be troublesome a drop of liq. morphiæ

may be added, or three drops of Tinct. Camph. Co., or five drops of belladonna should the cough be very explosive.

*Depression of circulation.*—Many practitioners also add five drops of antimonial wine as a depressant to prevent spasm and lower the blood pressure. But if there be great excitement of the circulation, and much restlessness after the acuteness of the spasmodic attack has subsided, I prefer to use the wet pack. Tincture of aconite in drop doses, may be more convenient.

*Convalescence.*—During the day succeeding the nocturnal onset, the child should be confined to bed. He may probably object, but should be amused with pictures and toys. Although there may appear to be but little the matter with him, still it is well, as tending to prevent relapses, to keep him in bed for a day. If there be any elevation of temperature (it is frequently slightly raised) the bed should be deemed still more necessary.

As a rule, the treatment above indicated need not be continued more than 36 hours; the complaint left untreated often lasts three or four days.

It should not be forgotten that occasionally the catarrhal croup is the preface to a genuine membranous croup. The diet in cases of spasmodic (catarrhal) croup should be of the unstimulating kind, but need not be restricted to slops. A little fish and milk pudding may be allowed in the daytime after the night attack, if there be no fever and no complication such as bronchitis or pneumonia. It is a fact that the spasmodic laryngitis may be the initial symptom of severe bronchitis or broncho-pneumonia; the anxiety which fastened itself on the larynx in the night changes its venue to the lungs next day. But this is rare except in measles. Meigs and Pepper correctly advise that meat and most vegetables should be avoided until convalescence is established. I should say prevent constipation and overloading of bowels.

For the treatment of the chronic state and the removal of the nervous habit the measures recommended for the removal of epilepsy and those advised in the treatment of catarrh should be carried out. Some use chloral in gr. iii. doses three times a day for a child of three. Opiates are also employed, as in hooping cough, to dull the nervous sensitivity. A few grains of Dover's powder at night time often removes the harassing cough.

There is no disease, perhaps, except asthma, which needs more preventive treatment than this hereditary spasmodic croup, and consequently the intervals between the croups should be devoted to removing the nervous habit of body which is the boy's or girl's inheritance. The circulation should be kept efficient by warm woollen clothing *cap-à-pied;* by outdoor exercise in the fresh air of a suitable climate (Bournemouth is good for most of the cases); by the avoidance of all fatigue, and by the careful regulation of the dietary, though there are no hard and fast rules to be laid down here. It is essential that some fat be eaten; some bacon fat at breakfast is usually agreeable. Too many eggs and too much meat are generally provocative of attacks, probably by giving the liver too much work to do in metamorphosing the peptones brought to it, or by the pancreatic and gastric juices being taxed beyond their powers. The bowels must be daily evacuated. This complaint, like scrofula and some others, is eminently one that is benefited by a massage of fifteen minutes once a day. It is best to give it shortly before going to bed, for it acts as a sedative; sound sleep is a great warder off of attacks. This may be said in spite of the fact that the child is often awakened from his sleep by the attack. Inquiry should be made whether the child dreams, and the cause of this should, if possible, be found out. A want of regularity in the meals or some derangement of the bowels will usually, but not

always, explain the dreaming. These children often have a dietetic idiosyncrasy, *e.g.*, cream may almost as surely provoke an attack as the night follows the day.

*Treatment of relaxed throat.*—A solution of argentic nitrate (gr. v. to ʒi.) may be applied to the fauces by means of sponge, mop or camel's-hair brush once a day for a few days, then every other day. A long and relaxed uvula should be treated by the application of lunar caustic, or snipping off the very end.

Of the treatment of **œdematous laryngitis** by *calomel*, I have no experience, but Dr. Bevan, of Dublin, has had much success with it. The calomel is given as soon as the child is seen, in grain doses every half-hour, until the passage of green stools, which usually happens in eight to twenty-four hours, indicates that the system has become affected. Blue ointment is rubbed into the larynx (I should not object to this part of the treatment). But if the hot steam, local applications and emesis by sulphate of copper failed, whilst the voice was growing weaker and the chest walls receding with inspiration, I should put an end to the laryngeal excursions and stridor, and the patient's profound distress, by performing tracheotomy. These cases, indeed, should be regarded as more like diphtheria of the larynx, than anything else. A *supporting* plan of treatment is necessary, therefore the patient's strength should not be exhausted by calomel, or by waiting for tracheotomy as a *dernier ressort*. It is true that the cases sometimes differ from diphtheria in possessing a very obvious cause (drinking boiling water), and for these occurring in previously robust children the calomel treatment may have a trial, but for those œdematous forms which occur as the result of acute disease (typhoid, erysipelas, small-pox) it must be condemned. In the œdema of Bright's disease, which also occurs occasionally in children, and in that which may rarely occur in the course of chronic laryngitis in children (tubercular or syphilitic), tracheotomy should, as a rule, be performed. But a sweating dose of nitrate of pilocarpin is deserving of trial. The tracheal tube is not so great a *bête noire* in simple or œdematous as it is in diphtheritic laryngitis.

**Membranous laryngitis** is treated generally and medicinally, like catarrhal spasmodic laryngitis. (See Diphtheria.)

Alkalies are highly prized by some. Citrate of potash and chlorate are those generally used, and in combination with iron. I prefer

adhering to iron alone internally in the absence of spasm and obstruction. The alkalies are given in large doses frequently, beginning with two grains for a child of three. They are said to promote the separation of membrane.

Anti-spasmodics as under catarrhal croup. Opium is lauded by some, as Dover's powder or tincture. I cannot recommend it. If there be much bronchial obstruction it is injurious. It depresses the respiratory centres, and lessens the power of the child. Baths, local applications, and emetics are more effectual, and not so depressing.

*Topical treatment* is the same as that for pharyngeal diphtheria (q.v.), but I do not advise any interference with membrane in the larynx. It is difficult to carry out. Any loose membrane should be detached both before and after tracheotomy. The sprays, vapours, and applications are used for the same purposes as in the pharyngeal affection, *i.e.*, to separate the membrane, to dissolve it, and to prevent its reproduction.

**Chronic laryngitis.**—*Syphilis* is the commonest cause of chronic laryngitis; but chronic inflammation may result from an attack of membranous or catarrhal disease, and may accompany the development of new growths in the larynx. The symptoms are hoarseness of the voice and obstruction to the breathing of a chronic kind; acute dyspnœa frequently occurs, either as the result of spasm of the muscles or as the effect of a fresh exudation into the submucous tissues. The inspiration is usually attended with a stridor, and if the mechanical obstruction be considerable the expiration may be of an audibly noisy character. The sufferer, then, from a chronic laryngitis may appear from time to time to be the subject of genuine croup; this is easily explained if the truth be remembered that croup as a symptom is merely an acute attack of obstruction to the passage of air through the larynx. The cough may be very distressing. (See p. 196.)

The *treatment* of chronic laryngitis depends chiefly on its cause. If the disease has resulted from an acute attack or from syphilis, the local treatment may be very much the same for each. The acute exacerbations should be treated by the inhalation of steam in which carbolic acid is atomised, and

by the employment of hot flannels to the front of the neck, which should be irritated by some turpentine liniment. If these measures be of no avail, one leech may be applied to the skin over the larynx or manubrium. Some practitioners employ ice-cold compresses to the front of the neck, frequently changed. Tracheotomy may be required in the acute attacks. It may also be performed in the severe cases of much thickening of the laryngeal tissues as a remedial measure, thereby relieving all anxiety from sudden attacks of suffocation, and enabling the local treatment to be most efficiently applied to the diseased tissues. In the adult local treatment of the laryngeal disease is comparatively easy to carry out; but in children, owing mainly to the smallness of the passages leading to the larynx, the difficulty of applying remedies locally to the larynx, as well as of diagnosing the nature and the extent of its morbid conditions by the use of the laryngoscope, are not unfrequently insuperable.

The constitutional treatment is of the greatest importance, and comprises the careful regulation of the diet, the avoidance of close rooms by keeping the patient out doors in the sea air and the administration of cod-liver oil and syrup of iodide of iron, as for scrofula (p. 63). In the laryngitis of congenital syphilis during the first months of life mercury is decidedly required, but in the chronic conditions that remain after the first two years of life have been passed I believe that mercury is of but little value, and the more general means of strengthening the constitution are of the first moment, as, indeed, they are in the treatment of syphilis of no matter what age or in what constitution. The best way to employ the mercury in congenital syphilis, when the larynx is the most anxious seat of mischief, is to keep the blue ointment in contact with the skin of the front of the neck, and to rub it into this part.

Anæmia may cause chronic hoarseness in children as the

effect of weakness of the adductors of the glottis. The cure of the anæmia causes the aphonia to disappear (G. V. Poore). Sometimes aphonia is hysterical in origin even in boys.

**Growths in the larynx.**—Warty growths—true papillomata—occur in the larynx of children a few years of age.

The symptoms they produce are those of chronic disease of the larynx. The voice may be reduced to the condition of a low whisper in marked cases; dyspnœa of chronic kind, with recession of the chest walls and with a liability to the development of acute attacks of suffocative character, are the symptoms in severe cases.

In the early stage the symptoms amount to alteration of the voice, which may be merely hoarse, and to occasional attacks of stridor with the signs of imperfect entry of air into the lungs. The treatment is as difficult as, if not more so, than diagnosis.

Chromic acid may be brought into contact with the warts. Some prefer this to the galvano-cautery. Occasionally in children they may be seized with forceps, and torn away. Usually all these things are done in the dark. Swabbing the throat and larynx with a five per cent. cocaine solution may enable something to be done. I believe that thyrotomy should be performed, with a view to enabling the larynx to be thoroughly treated. The galvano-cautery is perhaps the best, after the larger growths have been cut away. Some prefer chromic acid; others salicylic paste made of the acid and glycerine. The tendency for these papillomata to recur has to be borne in mind. Tracheotomy may be required to relieve a sudden paroxysm of dyspnœa.

## RETRO-PHARYNGEAL RETRO-ŒSOPHAGEAL AND PERI-LARYNGEAL ABSCESS.

*Retro-pharyngeal abscess* is an important affection; it is specially dangerous in infants under the age of one year;

these abscesses are frequent at this period of life; their diagnosis sometimes presents difficulty.

Most of the abscesses are "idiopathic;" some result from acute specific fevers; others from disease of the cervical spine; a few have been attributed to injury. The *symptoms* are usually characteristic: dyspnœa, dysphagia, and a peculiar stridor during inspiration, and sometimes during expiration; the stridor may have a croupy quality. The symptoms of obstruction to the entry of air into the lungs are usually more marked when the child is in the recumbent posture. The dyspnœa is frequently of a paroxysmal nature. I saw one infant aged five months in whom the symptoms were of long duration: she was perfectly hoarse for three months, had much loose muco-pus in the fauces, with considerable recession of the lower parts of the chest walls and supra-sternal fossæ; she died rather suddenly. The parents refused tracheotomy. I could not detect the abscess with my finger passed into the throat as far as possible. A necropsy made with Dr. Oldman, of Bletchingley, revealed a chronic abscess containing thick greenish pus, situated behind the œsophagus; there was no other sign of disease in the body, and certainly no cervical caries.

Retraction of the head may be observed; it may be due to the presence of bone disease or to acute swelling of lymphatic glands at the back of the neck. The swelling caused by the abscess may usually be detected by the finger passed into the pharynx. It may also be seen bulging the posterior wall of the pharynx, and may cause a swelling in the side of the neck. Displacement of the larynx may be observed. Sometimes the abscess bursts spontaneously, and the matter may then be swallowed or ejected through the mouth or nostrils.

All the symptoms of this form of abscess may be caused by a solid exudation in the retro-pharyngeal region.

The **treatment** is simple and usually efficacious: a guarded

bistoury passed into the swelling from the mouth. The abscess may be emptied, if the way seems clear by aspiration through the skin of the neck. Suppuration may occur outside the larynx in other situations than retro-pharyngeal; there is no need to separate these from the latter, inasmuch as the symptoms are practically the same, though the abscess may be detected with greater or less ease. If the abscess be visible or palpable it should be treated as any abscess by hot fomentations and poultices. An exploring syringe may be used in the diagnosis. The treatment should be tracheotomy unless the abscess can be opened and pressure removed from the air and food passages. Not unfrequently the child's strength is greatly lowered as the result of dyspnœa, dysphagia, and of previous disease. Stimulants and nourishing food may be required—brandy, eggs, beef tea, meat juice, mutton broth, Mellin's food. It rarely happens that the dysphagia is so great as to require the use of the nasal catheter. The rectum may be made use of to administer peptone suppositories and the like, should prostration be great.

## BRONCHITIS.

Infants and children, especially feeble and rickety ones, are prone to take bronchitis. Children with heart and lung disease are also remarkably liable. Of its occurrence in measles, typhoid fever, hooping cough and other fevers all are aware. The symptoms and physical signs are the same as in adults—the provisoes made in the introductory chapter on this section being taken into account.

The special tendency for bronchitis in children to lead to overburdening of the right ventricle, with its possible consequences of asphyxia, coma and convulsions should ever be borne in mind. This danger is greater the more extensive the bronchitis, and the more it affects the smaller tubes. There are no means of diagnosing **capillary bronchitis** from

disseminated broncho-pneumonia. In both diseases the fever is high, the venous system full, the pulse respiration ratio disturbed, the rhythm of respiration altered, the pulse feeble, the skin pale, sweating and livid. The physical signs give no special aid unless the consolidation is sufficient to cause dulness and tubular breathing. Increasing asphyxia and engorgement of the right ventricle is attended with feeble shallow breathing, loss of voice, ineffectual cough, mental apathy and muscular twitchings; these symptoms are due to irritable weakness of all the nervous centres concerned. **Chronic bronchitis** occurs in weak strumous children, or may be left after measles or hooping cough. Beyond preventing full and perfect growth of the body, leading more easily to chest deformities, spinal curvatures and finger clubbing, there are not any remarkable differences between the chronic bronchitis of children and that of adults. The art of preserving the health of children is of vast importance in the treatment of bronchitis. A cold and wet atmosphere, especially if a constant climatic condition—including as it generally does sudden variations in the temperature, barometric pressure and electrical phenomena — is generally the best friend to the bronchitis and the worst enemy of the child. The child is a better measurer of hygiene than is the adult. Accurate adaptation of clothing to the whole surface of the body, avoidance of the causes of chill, of overcrowded rooms or impure atmosphere—so oft repeated—cannot be passed over here without still further recital. Special chest protectors are not necessary, but if they have been worn it is not advisable to remove them in cold or changeable weather. When saturated with emanations from the body they become centres of filth, germ growing and parasite promoting. If used they must be disinfected in a hot chamber frequently. A carefully made woollen undergarment is the best chest protector. For the general treatment of capillary bronchitis I must ask

the reader to refer to the instructions given under catarrhal pneumonia.

*Treatment of bronchitis according to state of cough and secretion.*—Stimulant expectorants should be avoided when the cough is hard and secretion absent. Usually increased congestion is attended with increased secretion, but in bronchitis (as in the first stage of catarrhs generally) there may be intense hyperæmia with dryness of surface, just as happens in the physiological action of atropine. May there not be an alkaloid like atropine at work in many an ordinary inflammation? Stimulant expectorants as a rule raise blood pressure and diminish secretion. When the secretion is scanty, viscid and with difficulty coughed into the pharynx, alkalies are valuable; as also are expectorants like ipecacuanha, lobelia and iodide. All these agents increase the fluidity and the amount of the bronchial secretions. The value of the bronchitis kettle consists in supplying warmth and moisture to the inspired air, which tend to promote secretion from dry and congested surfaces. Sometimes the cough becomes hard and the secretion scanty only for a few hours at a time; the steam inhalation may then be used intermittently. Draughts of cold air playing on the neck and chest raise the blood-pressure and diminish the secretion, probably by reflex vaso-motor action. Cold air acting directly on the dry, congested bronchial surface would tend still further to diminish secretion and to maintain a hard cough. These are the reasons for keeping the child in bed under a ventilated tent with the neck and chest carefully clothed. For the same physiological reasons a child with bronchitis is confined to one room; thus the irritation to the skin and bronchial mucous membranes which may result from the atmosphere of halls, passages and unused chambers is avoided. The air of unused apartments is hygienically as deleterious as that outdoors, and perhaps worse, because stagnant and likely to contain more dust and

noxious emanations from carpets and furniture. The tendency for furniture to part with its substance to the atmosphere is well illustrated on entering a closed railway compartment especially on a hot day. Such instructions are the more necessary for febrile children whose resistance to the usual conditions of the environment is lowered. The necessity for perfect rest in bed, implying the least possible expenditure of force, is thus physiologically explained. Five grains of citrate of potash and ten minims of sweet spirits of nitre may be given three times a day in sweetened camphor water to a child two years old.

Vini Ipecac., ɱv., may be added, or Tinct. Lobeliæ Æth., ɱv., especially if there be spasmodic obstruction. The sodium or potassium iodides may be prescribed in two-grain doses to a child of the same age.

*Counter-irritation* by means of poultices and embrocations is most valuable in influencing the cough and secretion. They have the property of modifying the mucous membrane in opposite directions. If the cough is hard they loosen it, and conversely, when secretion is free, they often act as tonics to the congested vessels, bracing them, raising arterial pressure and diminishing secretion. A thin jacket poultice of linseed meal with mustard (16 parts to 1) is an excellent stimulant to the respiratory centres, and it influences as above indicated, the condition of the mucous membrane. The mustard may remain on for an hour, the skin being guarded as usual by a thin layer of muslin or linen. A fresh simple poultice should then be 'prepared, if the effect has not been sufficient. Some prefer repeated sinapisms. Small areas of the surface of the chest may then be irritated successively by stronger mustard applications, which remain on a few minutes in each place. After the removal of the poultices the skin should be smeared lightly over with sweet oil, and the chest covered with a layer or jacket of cotton wool, so as to keep the surface at a uniform and warm temperature.

The time for stimulant expectorants is when the secretions become profuse and the cough loose.

℞ Ammon. Carb., gr. ii.
Vini Ipecac., ♏v.
Aq. Camph., ʒii. t.d.s.

or ℞ Ammon. Carb., gr. ii.
Tinct. Nucis Vom., ♏ii.
Inf. Senegæ, ʒii. t.d.s.

for a child two years old.

Kobert says senega owes its expectorant power to two glucosides which are also contained in Quillaja saponaria, an infusion or tincture of which has been used by Goldschmidt successfully as a palatable substitute for senega in children.

Turpentine or terebene inhalations also act as stimulants and tend to lessen secretions. They may be prescribed internally in syrup, honey, or sugar, or in the Mist. Amygdal Co., or best in little capsules. Two-drop doses will be suitable for a child of two, repeated three or four times a day. For other remedies to check excessive secretion see Chronic Bronchitis and Dilated Bronchi.

Drinking linseed tea, or thin barley water flavoured with lemon essence, relieves a hard cough and promotes sweating and diuresis. There is less need for these drinks when the secretion becomes free.

The morbid sensations in the chest, and the unhappiness due to the influence of the complaint on the cerebral cortex, may be relieved by the above-mentioned expectorant, counter-irritant and demulcent agents. The distress of children in bronchitis is a most important item for treatment.

The *feeding* and *internal stimulation*, and other measures necessary in **capillary** bronchitis, are carried out on the same principles as those recommended in catarrhal pneumonia.

When the smaller tubes are loaded with secretions, and but little air is entering, the case is desperate, and the practitioner is placed between cross fires. An emetic is the proper remedy for unloading the tubes, but the patient's vitality may be reduced to the lowest ebb. Undoubtedly free stimulation with brandy, whisky, or champagne in dram doses frequently

repeated is urgently needed. Though the emetic must prostrate somewhat, it should be given combined with free stimulation. Profuse exudation gurgling in the tubes may be attended with sleepiness and drowsiness. Opiates must not be used, lest the tendency to coma and bronchial paralysis be increased. Opiates diminish secretion, but paralyse the respiratory neuro-muscular apparatus and thus lead to further clogging of the tubes.

Coughing should be encouraged if the child is old enough; an emetic is very good treatment under such circumstances, for it not only rouses the respiratory centres and removes mental apathy, but helps to throw the secretions out of the tubes.

Emetics, indeed, are valuable in most cases of bronchitis. All seem agreed that sweating tends to relieve the congestion of bronchial mucous membranes. Sweating may be regarded as derivative and a sedative expectorant. Liquor ammoniæ acetatis in half-dram doses may be used alone or in combination with the hot air bath. Like emetics or nauseants they depress the circulation, moisten the skin and increase secretion from congested tubes. Antimony, aconite, and ipecacuanha have a similar action; but the two former are too powerful for general use in children and the depressant action on the heart is not a desirable effect in itself.

*Purgatives.*—Free purging, except once at the outset, should be avoided. It is the correct thing to give a calomel and jalap purge at the onset of bronchitis, as of most acute febrile diseases in children, if the tongue is loaded, the skin sallow, the liver and spleen swollen, and the bowels confined; in other words, if portal paralysis exists (see Ague). Afterwards mild laxatives may be employed—fluid magnesia, castor oil, compound liquorice powder, if the bowels are not opened.

*Cough* may be relieved by the circumstances and conditions previously mentioned. If these be insufficient to allay it and

the distress and attendant exhaustion, the doctor must examine carefully the state of the nose, throat, and other parts of the body, for conditions outside the bronchial apparatus may be large percentage causes of cough. Besides turpentine and terebene, compound tincture of benzoin or carbolic acid may be used as an inhalation to check secretion and diminish cough. The throat may be the "trigger area" of the cough; if this is the case mopping or gargling the throat with an astringent preparation, or with a five-per-cent. solution of cocaine hydrochlorate, will often prove effectual.

*Convalescence* requires the usual precautions against the internal and external environment—attention to bowels, diet, digestion, avoidance of cold, damp, nocturnal or impure air, etc. A change of air to a seaside place or to some high and dry inland health resort, is advisable. The climate to be chosen should be selected according to the idiosyncrasy and state of vitality of the child and to the state of the secretions. A dry and bracing climate suits most cases, but the cold may be too much for some children.

The cerebral cortex requires treatment. Misery increases bronchitis; happiness increases health and lessens bronchitis. A little alcohol may promote happiness. A new toy or other fascination, provided the digestion be good, will also promote the health of the cerebral cortex. Bright scenes, cheerful attendants—and those who exact obedience—are valuable adjuncts to other treatment.

To get rid of bronchitis, nothing is worse than allowing the child to trot about. Warmth and protection of the surface by rest in bed is far the best way of preventing an acute attack from becoming chronic.

Infants should not be nursed more than is absolutely necessary. Rest in the cot is the best way of eking out the breath and strength, which are taxed by nursing and movement. A child not really ill may play sitting up in bed with an extra

flannel jacket on, but supported by a couple of well appointed pillows.

Nothing but a febrifuge is required in slight cases :—

℞ Pot. Cit., gr. ii.
V. Ipecac., ♏v.
Syr. Tolu, ♏x.
Aq. ʒii. t.d.s.

for a child two years old. Absence of fever is a sign for removing the citrate from this mixture.

*Antimony* in this article is adequately represented by its absence. Some authors still use it—none I think, and verily hope, in infants under one year. Uncertain in its action in different individuals, there are few cases—and I have never seen one, at any period of childhood—in which it is preferable to less powerful paralysants of the myocardium and circulation.

*Bleeding* after the Sangrado fashion is dead for ever. Dry cupping and leeching still live a lingering and somewhat lonely existence. In infancy I must altogether deny their need. Hot baths and local applications, or even ice bags, will generally suffice for all requirements where the above agents are indicated. Blisters are not advisable to such delicate skins. Calomel in repeated doses is condemned.

Rickets, tubercle, or scrofula should be managed as directed elsewhere.

In **chronic bronchitis** hygiology is the most important question, or rather series of questions. A child compelled to live in a city or town should wear an oronasal respirator to filter and warm all the inspired air ; this must be insisted on in bad weather. The respirator need not be worn indoors ; that is not because the air inside a house is any less dirty than the circumambient atmosphere. Respirators must be disinfected by being placed in a very hot stove every day. Children suffering from chronic bronchitis should be treated like the scrofulous (see p. 61 et seq.).

Cough and râles are not always present ; but almost any exciting cause, either in the child's internal or external environment, will be sufficient to bring back both cough and secretion if they are absent. Dyspnœa and emphysema may

always be present, and may be equally influenced by changes in the internal or external environment. The necessity for attending to hygiene, diet, digestion and defæcation cannot be overrated. Repeated respiratory stimulants may be needed if the dyspnœa is more or less constant. A little alcohol with the meals is not the least useful stimulant to breathing as to digestion. Small doses of digitalis may be given intermittently if the circulation appears to be feeble and increasing the dyspnœa chiefly due to other causes. The fresh infusion is best in half-dram doses given as long and as frequently to a child of seven as may be necessary. Squills and nux vomica, with carbonate of ammonia, are other cardiac tonics.

The habits of life must be perfectly regular. Not even a minute expenditure of unnecessary force should be caused either by unsuitable food, disagreeable mental or bodily work. Deprivation of sleep and undue excitement with violent games, scolding, terrifying and the like, are most injurious; they upset not only the nervous balance, but the cardiac compensation.

I have known acute attacks to supervene simply apparently as the result of undue expenditure of nervous energy from the romping and excitement attendant on a birthday festival. Doubtless the heart becomes over-taxed in such circumstances. Even when every precaution is taken to prevent the room from becoming overcrowded, and the child from going into the cold passage or hall, and from committing indiscretions in diet, such entertainments often prove the exciting cause of a fresh attack of bronchitis in these hyperæsthetic weaklings.

If there be anæmia iron should be prescribed in that form most suitable to the state of the stomach. The bowels must be evacuated daily or the iron will do no good. Cod-liver oil as directed under scrofula is of immense importance.

Chloride of ammonium in five-grain doses three times a day will tend to check excessive secretion, and cod-liver oil

has a similar action. These two remedies might be prescribed together. Many other stimulants and antiseptics are used to lessen expectoration or its equivalent. Balsam of copaiba with liquor potassæ, of each five minims, with ten drops of sweet spirits of nitre in two drams of camphor water, is a convenient prescription. If the secretions be very viscid and hard to eject, alkalies and expectorants of the sedative type are indicated. Bicarbonate of soda, wine of ipecacuanha, liquor potassæ are useful, and may be given in a stomachic infusion of gentian or calumba. For further treatment see Bronchi-ectasis.

The importance of long residence in a suitable *climate* for cases of chronic bronchitis cannot be over-estimated. Where the bronchitis is associated with bronchial asthma Bournemouth, which is warm, but not relaxing, except in the hot months, suits a large majority of cases; others do better at mountain stations or dry inland farms; these are cases in which the secretion tends to be excessive and the child thin and neurotic rather than strumous and stumpy. The majority of chronic bronchitics are of the short and stunted kind. A sea coast at a moderate elevation may be the most suitable; the Riviera, Canary Islands, and Algiers are some of the most in vogue. Caution should be given in sending the child away that cold and damp days should be passed indoors, with the necessary regulations as to ventilation and warming of the apartments.

## BRONCHO-PNEUMONIA.

Broncho-pneumonia, or catarrhal pneumonia, illustrates some of the canons of infantile pathology perhaps better than any other serious disease of childhood. Our hereditary enemies, low temperature and humidity, always act at an advantage in the causation of disease when the subject is an infant. This and the tendency for disease to spread is well

illustrated in broncho-pneumonia. If the protoplasm as a whole (the general constitution) be brought below par by any disturbance of normal functions or by any disease, the tendency for bronchitis to involve the alveoli of the lung becomes exceedingly great.

The contrast between lobar and lobular pneumonia is highly instructive. In both there is marked depression of vitality; this arises in lobar pneumonia as the result of direct neuro-muscular prostration, whereas in broncho-pneumonia it is due to overloading of the right side of the heart and to engorgement of the lung circulation. Lobular pneumonia usually begins insidiously, supervening on bronchitis as in measles, hooping cough, diphtheria and rickets. The rise in temperature may be sudden and great; the arterial circulation is not full and bounding, but rather empty in a typical case, whilst the venous system is full; the surface of the body tends to be cold, clammy and wet, rather than hot, pungent and dry. The course of the pyrexia in the secondary disease (broncho-pneumonia) is very irregular, and its termination is almost always gradual and slow. The duration, too, is often twice as long, and may be many times longer than lobar pneumonia. The tendency is towards death from asthenia through asphyxia; not directly from cardiac or nervous weakness as in lobar pneumonia. The disease is very common during the first two years of life, and thus again contrasts with lobar pneumonia.

The onset of broncho-pneumonia is usually known by a sudden rise in temperature, a sudden alteration in the character of the cough, which, from being loose and paroxysmal, becomes short, sharp, hacking, and evidently painful. (Like that in croupous pneumonia and pleurisy, this cough is very likely a reflex from irritation of the pleural serous surface.) The respirations may be of "expiratory" character; they are hurried; the child may show that it feels the want of

breath by sitting up in bed and struggling. Lobar pneumonia, as a rule, does not cause sensations of want of breath, for the child lies in the horizontal position without distress. The struggle for breath is evidenced physically by recession of the soft parts of the chest walls, and by overaction of the facial, costal and cervical muscles. Great engorgement of the right heart makes the body surface marble-white, the lips blue and the nail-beds dusky. The anterior nares work intensely in both forms of pneumonia. Corresponding with the increasing burdening and paralysis of the right heart, the voice and cough become feeble almost to suppression, and the ejectment of bronchial secretions into the pharyngeal cavity a sheer impossibility.

In this state the coma of asphyxia with its death-like apathy passes into real death with attendant apnœal convulsions, which had long been brewing, as the twitchings in the limbs, face and eyes showed.

Lobar pneumonia tends to get well, and if death occurs it is frequently unexpected; in lobular pneumonia the frequent fatal termination gives increasing and deepening warnings of its approach in the labouring and struggling of the lungs and heart.

In many cases of simple broncho-pneumonia the spleen is enlarged; this enlargement subsides as the disease disappears; this circumstance increases the difficulty of diagnosis; in some cases the mental symptoms are so marked that one may be consulted on the possibility of the case being one of tuberculous meningitis. Despair should not reign in the physician's breast, no matter how high the temperature, how rapid the pulse, or how high the rate of breathing; fits of fever and dyspnœa and cardiac acceleration are very common.

The physical signs may be those of scattered dulness, chiefly at the roots and bases of both lungs, and often over

the middle lobe of the right lung, which is prone to collapse and inflame; the breathing may be tubular, but is usually less typical than in the lobar consolidation. There are more adventitious sounds, and crepitations are generally heard all through the course of the solidification. Increased vocal resonance may be present, or there may be a diminution. Dilatation of bronchi or dense solidification, the tubes not being completely choked, gives a metallic character to the breath sounds and to the râles.

The only point of importance in the differential diagnosis is the question whether tubercles are present or not. This will have to be determined by the family history and by the progress of the case. If the child be some years old the long continuance of the signs and symptoms of catarrhal pneumonia is favourable to the diagnosis of tubercle.

The broncho-pneumonia of hooping cough and measles may persist for some months, and may eventually completely clear up. Sudden improvement and sudden deterioration both in symptoms and physical signs are often noticed in the pneumonia of hooping cough. There is a propensity for the consolidation to become fibroid.

The **treatment** of broncho-pneumonia will tax the resources of the best nurses and doctors. The principles are simply those of supporting the strength of the heart, and using every means to increase the powers of inspiration and expiration. Cardiac and respiratory stimulants take a first place in the treatment; all measures that prevent loss of general strength will act at the same time as heart and lung stimulants.

*Prophylaxis.*—The affection is one that indicates general debility; our objects in tending infants with simple influenza, diphtheria, measles and hooping cough should be to ward off debility. Any infantile catarrh should be treated carefully; intestinal and gastric catarrhs should be promptly relieved.

*Hygiene.*—The sanitary arrangements and personal hygiene

are of lasting importance. But suppose the broncho-pneumonia to have developed in spite of every attention, then the child, being in a tent bed with a warm, moist atmosphere in a large airy, but draughtless room, may be further treated in the following way :—

The dietary should be sketched out, food being given in small doses every hour :—Milk and barley water ; mutton broth thickened with Mellin's food or its equivalent ; strong beef tea and meat gravy.

*Stimulants.*—Brandy should be given in milk regularly in doses of ten minims, repeated as often as necessary. The diet and stimulants form part of the general stimulation of the whole system ; there are other powerful means of effecting the same ends, which also, it should be borne in mind, strengthen both the circulation and the respiration.

*Cyanosis.*—Any increase in the weakness of the pulse, in the skin sweating or in the whiteness and lividity of the surface, may be promptly met by the hot bath, in which mustard should be strewn :—Two tablespoonfuls of mustard in two gallons of water for a child two years old. This stings the skin all over, increasing the depth of inspiration partly by its direct reflex effect, partly by making the child cry. It also arouses the cerebral centres and removes apathy. These baths may be continued for a few minutes, and repeated if necessary.

Is *bleeding* ever legitimate in overloaded right heart in young infants with broncho-pneumonia ? It is true the loaded veins may be relieved for the time ; but the cause of the overloading remains. True, time may be gained by bleeding, and the child may be aroused from its apathy ; the bleeding may kill by increasing the weakness. Any case must be considered on its own merits which require careful and deliberate weighing ; in most cases I should trust to hot mustard baths and free stimulation.

*Pyrexia.*—Sometimes it is the high pyrexia that is weakening the arterial circulation and lung movement. The *cold* bath, the cold sponging and the wet pack are valuable therapeutic agencies; the capillary head tubing (Thornton's) may be used alone; the water trickling slowly through the capillary tubes effects considerable reduction of temperature; it often makes the child brighten up and cry, both of which effects are good for the heart and lungs. If the cold bath be used, the water should be gradually lowered to a temperature of 65° F. The child may have an extra dose of brandy before going in and on being taken out of the bath, in which he may remain five or ten minutes, the thermometer, if possible, being almost continuously in the rectum to afford indications. The surface of the body is often cold and blue, whilst the internal temperature is high. When the child comes out the surface of the body should be thoroughly rubbed dry, and hot bottles may be used near the feet. It may sound contradictory, but I have had another hot bath with mustard put by the side of the cold bath, and have given the child's skin a taste of this for a few seconds after effecting some change in the temperature by the cold bath. It is well known that the temperature goes on falling for half-an-hour or so after the patient is removed from the bath; the first effect of a hot bath, by dilating the cutaneous vessels and presenting a larger surface of blood to the cooling effect of radiation is to lower temperature.

*Thermometer.*—The temperature of the body should be taken every three or four hours, and the bath repeated as soon as it gets to, say, 103° and remains there. Some physicians resolve on keeping the temperature below 101°.

Now if the fever be not higher than 102° we can get all the reduction that is necessary by the use of damp cloths or tepid sponging. The wet pack may be used as in fevers. When the prostration is extreme the water bath at a temperature of

65 to 70° F. should not be used. The milder measures should be preferred.

The icebag may be used instead of other applications; of its great value as a saver of strength, a soother of the nervous system, a lowerer of temperature, and reliever of pain I can bear testimony. Time alone can show whether it has the curative qualities which Dr. Lees claims for it.

**Local applications.**—*Stimulating.*—But if there be no alarming increase in the heart or lung debility, we may content ourselves with such stimulation as may be gained by the use of poultices, other hot fomentations and irritating liniments. The majority of cases which occur in measles, diphtheria and hooping cough, are treated by these chest and throat counter-irritations. A light jacket linseed poultice, on the surface of which a little powdered mustard is lightly dusted with a castor, may prove a most comforting and thorough stimulant to the heart and lungs. The skin must be protected from the mustard by a thin layer of linen or muslin. Care should be taken to wrap the chest up in cotton wool on the removal of each poultice, which should not remain longer than two hours. Poultices are not always required. Sufficient stimulation to the breathing and the heart may be effected by turpentine or chloroform liniment. The skin should be thoroughly reddened and kept so. It is of no consequence even if blistering result in places, but in girls of the well-to-do this should be avoided, for cosmetic reasons, as the blistered surface may become permanently pigmented. Whether the stimulation be applied externally or internally, the effect is judged by the improvement in the pulse and by the increased depth and lessened frequency of inspiration.

*Emetics.*—Both these effects are also brought about by the use of emetics, which are valuable chiefly in the first day or two of the new fever and altered breathing and cough. Half-grain doses of bluestone frequently repeated is the best emetic.

**Internal remedies.**—*Stimulant and depressant expectorants.*—I always prescribe two grains of carbonate of ammonia, five minims of ipecacuanha wine and two drams of infusion of senega for a child two years old, every four hours when the cough is loose. But if the cough be hard, and secretion slight, then—

℞ Liq. Am. Acet., ℥xv.
V. Ipecac., ℥v.
Spt. Æth. Nit., ℥v.
Aq. Camph., ʒii.

every four hours.

The feeding of the case, if the infant is collapsing and comatose, should be done by the nasal tube passed into the stomach; and a peptone suppository may be introduced into the rectum every few hours if there be no diarrhœa.

*Diarrhœa* is sometimes very troublesome and reduces strength visibly. Opium should never be used when the lung trouble is urgent; it paralyzes the respiratory centres and dries up secretions, whilst increasing the tendency to or actually deepening the narcosis of the complaint.

*Tonics.*—When the disease is prolonged for several weeks iron and quinine are valuable tonics.

℞ Tinct. Quinæ Ammoniata, ʒi.
Ferri et Amm. Cit., gr. ii.
Glycerine, ℥xx.
Aq., ʒii.

may be given three times a day.

*Convalescence.*—As soon as convalescence is established, the child should be taken to a seaside place, care being taken to let it have plenty of fresh air, and at the same time to be so clad as to his belly, chest and head that no more catarrhs be excited.

## COLLAPSE OF LUNG.

The symptoms, causes, prognosis and treatment of collapse of the lung present but little differences from those of atelec-

tasis. There are all degrees in the symptoms, proportionate to the amount of obstruction to the flow of blood through the lungs, and to the amount of solid lung tissue.

Collapse may be the result of bronchial catarrh or of any kind of obstruction in the tubes; deficient vitality in which the neuro-muscular respiratory apparatus participates is a large percentage cause. Any catarrh, whether simple, from measles or hooping cough, may be its cause, but feeble vitality often due to rickets has fully as much influence as the catarrh. Consider also the statements made at the introduction of the section on respiratory diseases.

In the *diagnosis* of collapse or atelectasis from other pulmonary consolidations, an important point is the *lowness* of the body temperature; it is not above the normal, and is usually below it, even in the rectum. This serves to distinguish collapse from capillary bronchitis, catarrhal and lobar pneumonia. Roughly speaking the physical signs are pretty much alike in inflammatory and collapse consolidations. Typical cases of lobular and lobar pneumonia and collapse of lung may be generally diagnosed from one another; yet even the history and physical signs may leave one in doubt.

The essence and cause of collapse and atelectasis is weakness of the respiratory movements; there is not that labouring and struggling of respiration as in catarrhal pneumonia; if the muscles would only work efficiently, the collapse would not increase, and recovery would soon ensue; it is not that the muscles are overtaxed, but that they are not properly innervated; in other words, the nerve centres are not energized enough.

All **treatment** may be focussed to the principle of stimulation of the respiratory neuro-muscular apparatus; it has to be got to work as thoroughly as possible. The medullary centre may be filliped by mustard baths to the whole body;

it may be strengthened by the administration of brandy and ammonia ; it may be kept working by voluntary effort in those who possess "a will." Torpor of the infant, and especially of the infant whose lungs are partly solid, aids in the maintenance of the feeble respiratory power. Of great value are :— Emetics, embrocations and inversion of the infant so as to keep plenty of blood in the head. These measures, directly or indirectly, arouse the respiratory nervous centres. For other treatment see the congenital form and the paragraph on asphyxia neonatorum. A knowing child should be instructed in voluntary efforts at deep inspiration. Crying is a good sign of improvement, and will further improve the respiratory powers. Our focus still in view—the necessity is great for keeping the air warm, fresh and free from all impurity, for maintaining the corporeal surface at a constant adequate temperature, and for stimulating the body by efficient nourishment and stimulants. Cold devitalizes the body and the respiratory centre and may excite more catarrh and collapse. Defective feeding allows the respiratory centres nothing to energize themselves with. Defective oxygenation increases the depth and frequency of respiratory nerve discharges ; the disadvantages of asphyxia outweigh the advantages.

## PHTHISIS.

Remembering the canons of infantile pathology (see p. 1), there is but little in the various forms and degrees of infantile phthisis which requires a separate description. Their remarkable powers of recuperation; endurance of febrile body-heat ; difficulty of expectoration, or rather hawking ; the unreliability of percussion and auscultation as indicating pulmonary lesions—these are the factors which modify children's phthisis, and often render diagnosis more difficult —especially diagnosis of details—than obtains in the adult. Cavities are rarer in infancy than adults, yet there is no

lesion, no symptom, and no sign, which may not occur in the phthisis of infancy and childhood (see Chapter IV.).

The *diagnosis* of acute phthisis may have to be made from croupous and catarrhal pneumonia, severe bronchitis, typhoid fever, and acute general tuberculosis. The greater severity and onward progress of the general symptoms (atrophy, anæmia, asthenia, fever, sweating), the physical signs of rapidly forming cavities, and the detection of areolæ of elastic tissue and bacilli—in the sputa wiped if necessary from the base of the tongue—are the most important features. Consult also the sections on the other diseases.

The *diagnosis* of chronic phthisis is often difficult owing to the ease with which children bear chronic disease generally without showing much atrophy, anæmia or asthenia. Empyema, mere debility, with catarrhal signs in the chest, prolonged catarrhal pneumonia, bronchi-ectasis with fibroid lung, are the other maladies most to be considered and differentiated from chronic phthisis; indeed, the last two are practically indistinguishable from many cases which the necropsy shows to be tubercular disease or simple fibrosis (in which the liver and kidneys may have participated). Not even the tendency for catarrhal pneumonia to pass away can be regarded as its sole prerogative, for actual tubercle is not without at least an occasional favourable termination, especially in the child. Areolæ of elastic tissue and tubercle bacilli may afford help in the differential diagnosis; authorities are divided as to whether fibrosis has a bacillary accompaniment. For the diagnosis of empyema see what has been written further on.

The **treatment** of phthisis demands division into different departments.

The doctor must drain the resources of the art of preservation of health, for individuals born at a disadvantage in the struggle for existence. The child who may become

tubercular or phthisical, is often the offspring of tubercular parents or ancestors (atavism). Tubercle frequently appears before the first set of teeth have been cut; but generally after this period. If there be anything in the idea of the contagiousness of tubercle, the necessity for the child's not being brought up by phthisical people or in phthisical surroundings is emphasized. The mother, if delicate or phthisical, should not suckle her infant. A healthy wet nurse is in every way to be preferred—partly because human milk will be the best to prevent any tendency to catarrh of the intestines, which is likely to be associated with catarrh elsewhere and sequent debility; or debility may come first and catarrhs later; and partly because, if cow's or other milk be used, there is a liability to contamination of it with tubercle (bovine tuberculosis), as well as the possibility of its not agreeing with the infant. All artificial foods must be exposed to the atmosphere, and thus there is risk that the dust containing germs may form part of the infant's ingesta. From these considerations the corollary is drawn that a pure atmosphere is a real necessity. Wherefore tubercular children should not dwell in large towns or cities, but in dry, elevated country places free from sanitary defects. An inevitable depression of vitality and injury to the mucous membrane of the respiratory passages must follow exposure to the emanations from decaying organic matter, such as always abounds in thickly-populated parts. The deleterious effects of dampness, of malarial poisons, of sewer gas and of an atmosphere rich in chemical, mechanical, and living impurities must also be averted. The indispensableness of warding off hooping cough, measles, and typhoid fever is another cogent argument for the avoidance of towns and cities; for it is probably true that these diseases are the appanage, as a rule, of a dense population and its consequences. It is not good for tubercular children to

enter for children's complaints; it is good for them to "get over" them, which they often fail to do; but it is far better that they should never have them, or should wait till they reach adult age, when they may be better able to cope with them. What has been said elsewhere as to ventilation during sleep and waking, to clothing, exercise in the open air, and the regulation of the diet with attention to the appetite and bowels, the avoidance of every possible mental, nervous, or physical agent or agency of depression of vitality, applies with the strongest emphasis here.

The nutrition of *nerve and muscle*, and especially of respiratory nerve and muscle, should be maintained at any cost by the getting of sufficient sleep and enough exercise, by regulation of the diet, so that both sleep and exercise may be possible and by the prevention of catarrh of the respiratory organs. As a rule improvement of one organ improves others; derangement of one deranges others. Is it necessary to say that long, narrow chests with small lungs are not the only seats of tubercle—that broad thorax with large lungs may have it too?

When there is a lesion in the lung the above preventive medicine is equally necessary; often the diet and appetite require further consideration and careful study. Five grains of bicarbonate of soda and five drops of tincture of nux vomica for a child five years old, with two drams of compound infusion of gentian, may in virtue of its bitter alkaline tonicity give appetite, aid digestion and strengthen the frame; it should be given before meals to excite the gastric action and secretion; an acid may answer better. Treating rationally, this should be taken towards the end of gastric digestion, so as to leave the stomach with the last parts of the chyme and afford a further stimulation to the duodenum.

℞ Acid. Nitric. dil., ♏iii.
Liq. Ext. Cinch., ♏iii.
Syr. Aurantii, ♏xxx.
Aq., ʒii. t.d.s.

The diet may have to be of the fancy description; nothing being positively interdicted, but excess of sugars and starches should be avoided. Fats are generally disliked, but are good. The food which agrees best should be taken, and no medicaments which cause repugnance or disturb the even course of life should be prescribed. Undoubtedly milk and underdone meat, pounded chicken, cream and new-laid eggs are good if the child likes them, can be got without trouble to take them, and having got them, can dispose of them to advantage without taxing his liver, kidneys, or brain, and without unduly closing or opening the primæ viæ. A tablespoonful of sound wine should be ordered with the dinner, which should be at mid-day unless the child has an idiosyncrasy and digests better about six p.m. Further stimulation and dieting may be required in acute cases, which are managed on the same lines as typhoid fever, pyrexia being reduced as in other febrile states. Cod-liver oil is the sheet anchor of the special treatment of chronic phthisis; but thought is required in prescribing it. The number of "dodges" which may be devised to get it down are innumerable, but compulsion is against all the laws of infantile therapeutics. Salt on the tongue, orange wine, lemon wine, stout, tasteless oil, almonized oil, biscuits, capsules, and the prescriptions and methods given on p. 65 et. seq. Mostly, however, children take it with avidity and digest it surprisingly; nevertheless the stools should be watched for it, as for casein and unsolved starch. When it cannot be taken as in older children, most frequently inunction is a lost cause. *Maltine* in half-teaspoonful doses, or less to begin with, may be substituted; it is a most "bilious" article in many thin neurotic children.

All the above medicaments are usually best taken and best assimilated with the meals ; they may be given at the termination of the same ; maltine often agrees far better when given, say two hours after meals, as the last chyme is leaving the stomach. Pepsin in five-grain doses may be prescribed with them if, after all that has been done, the digestion remains weak. It goes best with glycerine and a mineral acid. When the phthisis is very chronic and afebrile, sea-bathing in fine weather, or sea-baths indoors, are even better invigorators than the ordinary baths ; they should be carefully ordered, and the effects watched ; as with baths generally, so long as proper reaction follows they do good.

*Alterative.*—Chloride of calcium gr. v. in Extr. glycyrrhiz. gr. xx. and glycerine ℥xx., with water ʒii.

Lactophosphate of lime, hypophosphite of lime or soda, each in three-grain doses for children about five, may be given.

*Antiseptic.*—Iodoform has been given but requires caution ; begin with a half-grain in pillule, or with sugar of milk ; it may cause collapse, delirium, purging, or vomiting, but is often well borne ; it has not effected much benefit.

*Hæmoptysis*, which is rarer in children than adults, is an indication for keeping the child at rest ; excitements or reactions of any kind, whether by baths or otherwise, should be shunned. It is the eminence of thoughtlessness to practise percussion. Few agencies and no drug are of any real service in hæmoptysis.

Small doses of terebene or turpentine ℥v. in syrup or glycerine or in capsule may be prescribed.

Tincture of hamamelis (℥v.) has been tried and Liq. Ext. of Ergot ℥xv. (See also purpura and hæmophily.)

*Cough* may be relieved by local applications to the throat, gargles, sprays, anti-spasmodics, and by depressant or stimulant expectorants, but none of these means should be employed indiscriminately. First is to be ascertained as far as possible the chief cause of the cough, which may be removed by general means, such as dietetic, gastric and intestinal regulations. If the pharynx be relaxed, or adenoid overgrowths be present, these conditions should be attacked by local cleansings with the nasal douche, by moppings with a sponge from the mouth and by medication ;

glycerine of tannin, or, better, equal parts of glycerine and strong liquor ferri perchloridi, or the galvanic cautery may be used to the adenoid growths. A simple gargle of chlorate of potash, gr. x. to ʒi. and warmed, or this sprayed on to the throat and larynx, may prove effectual. A little simple linctus of glycerine ʒss., and paregoric ♏x., for a child three years old may suffice to allay cough. A good dose of bromide of sodium or ammonium (gr. xx.) in syrup may prove effectual. For paroxysmal coughing see the treatment of hooping cough. Painting the fauces and larynx with a ten-per-cent. solution of cocaine is sometimes useful. For other treatment of cough and secretion see "Fibroid lung" and "Bronchitis." The various antiseptic inhalations may be equally useful here as in those affections.

*Profuse sweatings* are not always present in tubercle; possibly decomposing pus is the chief cause of sweating; they may be best relieved by liquor atropiæ in drop doses every night for a child three years old; great care should be taken to keep the linen clean and to prevent chill when these sweats are present; picrotoxin gr. $\frac{1}{100}$ may be prescribed in water.

*Anæmia* is prevented by the above general measures and by the administration of iron wine or syrup of the phosphates of iron. I nearly always use the former in gr. iii. doses of ferri et ammon. citratis made up with rectified spirit and water for a child three years old. A dram of the syrup of the phosphates or half-a-dram of the hypophosphites may be prescribed for the same age. Often one's way has to be felt cautiously, and sometimes the initial dose may be as small as five to ten drops. This cautious mode of commencement of drugs is important with iodides, and especially with the syr. ferri iodidi, which are generally most commendable for glandular swellings and naso-pulmonary catarrhs. Half-a-dram of the syrup is the most that should be given to a child seven years old. The iodide of sodium (gr. ii.) may be preferred, and may be combined with the iodide of iron; the tartrate of iron and potassium goes better with iodide of potassium.

## FIBROID LUNG AND DILATED BRONCHI.

Fibroid lung and dilated bronchi occur more frequently in childhood as distinguished from infancy, and are due to a very chronic inflammation of the lung, which, like all very chronic inflammations, has the characteristics of a new growth, and chiefly involves the supporting or connective tissues of the organs. The new growth of tissue may com-

mence chiefly in the interlobular septa, when pleurisy is the starting point; in the walls of the alveoli when catarrhal or rarely croupous pneumonia or collapse is the foundation; or around the bronchi when the affection rarely results from chronic bronchitis, and dilated bronchi come first, fibroid induration afterwards. The commonest cause of extensive fibroid induration in children is catarrhal pneumonia, such as results from hooping cough or measles, and collapse of lung after pleurisy or empyema. Sometimes fibroid change occurs after primary tubercle, and as a curative process; it rarely extends beyond the limits of the original disease, and may best be regarded as a thick scar. Syphilis may originate a disseminate interstitial pneumonia.

It will be seen that the total pathology of fibroid lung and bronchi-ectasis is practically the same in adults and children. Bearing in mind what has already been said concerning the physical examination of the thorax in children, the physical signs are not really different from those met with in adults. The chief *symptoms* are an absence of fever and a paroxysmal cough, with expectoration of large quantities of offensive muco-pus from the dilated bronchi. I say expectoration, because, at first involuntarily, and later voluntarily, the child does eject the stuff from the pharynx; it may swallow some, but the paroxysmal cough often leads to vomiting. There may be pains about the chest, some shortness of breath, and when the disease is advanced, anæmia, asthenia, and atrophy. But children, like adults, often bear this very chronic complaint without loss of weight—often, indeed, with increase of adipose tissue, especially when too much sugar or carbohydrates are taken. Any intercurrent affection may lay the child up, yet, considering the state of the lung, it must be confessed that the liability to bronchitis and broncho-pneumonia is no greater than might reasonably be expected.

A fine climate, with but little change in temperature, may prolong cases of the kind indefinitely, and without the interruption of an existence of moderate enjoyment. This fact gives the clue to the chief principles of **treatment.** The factors that make for the preservation of health in childhood need not be repeated. The clothes of patients give off quite enough mechanical fluff, not to say chemical and vital irritant particles, without the doctor having to contend against or the patient to withstand the impure additions to the atmosphere of our towns and cities. If the child is so poor that nothing in the way of a pure atmosphere can fall to its lot, at least it should be provided with a respirator to filter the air before it passes into the nostrils and mouth.

*Exercise* in mountain or dry sea air is of undoubted benefit. When there is evident shortness of breath, as in advanced cases, the exercise will have to be mostly of the passive kind—such as in carriages, or on boats or ships. *Massage* is well worth a trial. The danger in these advanced cases is the common one in chest complaints of overtaxed right ventricle from obstruction to the pulmonary circulation (see p. 184). In the earlier stages the high arterial tension, glowing skin, and increased excretion which attend active exercise in the open air will tend to the discontinuance of the fibroid overgrowth, and even perhaps aid in the disappearance of some of the most recent; but how scar tissue is to be removed by any amount of cod-liver oil or iodides passes comprehension.

It is important that *expectoration* should be efficiently performed at least once a day when the secretions are abundant, and still more if they are of the offensive kind.

There should be no mistake on this matter. The amount of exhaustion that attends a vomiting of a few moments' duration is practically nil. Indeed, the vomiting is posi-

tively a stimulant to the brain, heart and respiratory nervous centres. Every day, and preferably at the night time, four hours after the last meal, emesis should be carried out ; it matters not what with. (See p. 160.)

After a time the patient can often vomit by tickling his own fauces simply ; this occurred in one case of a boy six years old. Most of these children are "old" in their ways. Indeed, this daily clearing out may become no longer necessary, for the tubes certainly get narrowed, and their muscular tissue well-nourished, even hypertrophied, provided that the ulceration has not previously led to actual vomicæ.

Internal *tonics*.—In my experience there is nothing better than arsenic or strychnia with cod-liver oil, which certainly promote the nervous activity of the respiratory apparatus, and give tone to plain muscular tissues everywhere. The liquor strychninæ may be given in full doses, ℥iii., three times a day for a boy seven years old, and after meals. The arsenic need not be pushed. The good effects are obtained by two minims of the liquor arsenicalis, taken three times a day after meals. (For the administration of cod-liver oil see p. 65.)

The object of these medicines is to improve the general nutrition, especially of the respiratory neuro-muscular system. The same end in view, a nourishing diet is necessary, though the appetite and digestive apparatus will have to be taken into consideration. The general instructions given under Scrofula, Principles of Feeding, and Athrepsia may be consulted for further guidance in this respect.

Other *therapeutic measures* consist in the alleviation of cough, and in the use of remedies calculated to diminish the expectoration and to keep it sweet. The climatic treatment carries out all these indications. Care is necessary to see that the indoor air at health resorts is kept sweet; certain inhalations are also a further means of ensuring sweetness. Terebene, iodine, sanitas—any antiseptic inhalation. The value of the air of pine forests here takes its stand. How are the inhalations to be

carried out? The agents may be atomised by Siegle's spray, by the vapour cones, by the steam spray, as in hooping cough (q. v.), or by some of the numerous inhalers. If the case be only a slight one, wearing a respirator for an hour or two every day may be sufficient, or breathing twice or thrice a day the vapours from a quart jug of boiling water in which two drams of Tinct. Benzoin Co. have been mixed. There are many formulas for such inhalations; to this article many of them are appended. Morphia is good for the cough; though it abates the secretion from the bronchi, it often deprives the intestines of bile, constipates and tends to increase the sweats. It may be necessary in some cases, but should be given only when other general means and local measures have failed. Attention should be paid to the naso-pharyngeal mucous membrane. Mopping out the back of the throat, after cleansing the same by gargles and douches, with a mixture of tinct. ferri perchlor. and glycerine in equal parts will often remove the cough and irritation about the larynx. (See also treatment of Rhinitis.)

*Counter-irritation* to the surface of the chest by iodine liniment once every day, or as often as may be necessary, to keep the skin tender, perhaps does some good, but not much. I never use blisters. Mustard leaves may be applied if bronchitis, or catarrhal pneumonia, supervene. If the breath be short, even when the patient is still, then carbonate of ammonia and strychnia are perhaps the best *stimulants* to the respiratory centres.

℞ Ammon. Carb., gr. ii.
Tr. Nucis Vom., ♏vi.
Glyc., ʒss.
Aq. Camph., ʒiii.

for a child seven years old, every four hours. The mixture should not be continued for more than a few days at a time; should then be discontinued, and resumed if necessary. The strychnia is intentionally a rather large quantity.

Remedies for *checking secretions* from the tubes and improving or soothing the condition of the mucous membranes lining the respiratory passages:—

The inhalation of simple or medicated steam, from a bronchitis kettle, Siegle's spray or atomiser, Maw's inhaler, the croup kettle, iodine inhaler (slipper-shaped, Nelson's), steam draught inhaler, double-valve inhaler, Martindale's inhaler. These are useful apparatus, and may be obtained of the usual surgical instrument makers.

The antiseptic respirator, with a simple perforated arrangement of

plates, between which the sponge saturated with the medicament is placed, should be of the oronasal kind. It is a far better filter than a medicament to the air tubes, for Dr. Hassell has shown that but little of the thymol, carbolic acid, or creasote, with which the sponge is charged, disappears after a few hours' inhalation.

A dram of pure carbolic acid, a dram of fir-wood oil, or these mixed ; a dram of Pumiline; two drams of spirits of camphor; two drams of turpentine or terebene—to a pint of boiling water, may be used as inhalations. Some employ ten-minim doses of turpentine or five of terebene pure internally, even in children. Terebene is harmful to infants a few months old. A good compound inhalation is fir-wood oil, four drams; carbolic acid, six drams ; juniper oil, two drams; comp. tinct. of benzoin, one ounce; water to half a pint; add three pints of hot water. For inhalation add one part of this solution to six parts of boiling water.

These inhalations may be employed, once, twice, or thrice a day according to the amount of expectoration and stench. They may be inhaled with advantage after meals; they sometimes seem to improve digestion; occasionally nausea may be excited; then two hours after meals is the best time. They may be inhaled ten minutes to half an hour also in relation with the degree of severity of the case. The patient should not go out in the cold air immediately after the steam inhalations. In cases confined to one chamber the spray of weak carbolic or sanitas may be kept going for many hours. Iodoform or carbolic acid may be used to disinfect the sputa. Excessive secretion may be checked, again as in adults, by the internal administration of many of the above-mentioned antiseptics, by the balsams of tolu and copaiba, and by astringents of tannin and gallic acid.

## EMPHYSEMA AND ASTHMA.

There is no need to waste much space on the pathology of emphysema as it occurs in the child. Degenerative disease is rare in childhood, and therefore this cause of permanent emphysema is absent at this period of life. But constant distension of pulmonary air cells will, no doubt, lead to destruction of capillaries and probably to the protoplasm and elastic tissue of the lung, though the staying powers of lung tissue are doubtless greater in the child than in the adult; in some

individuals, and perhaps families, there appears to exist an inherent weakness or inadequacy of the elastic tissues, sometimes of the lung only, sometimes of all the elastic tissues of the body; this may explain an early tendency to emphysema and the like. Chronic emphysema is not common, however, in children. When it is seen the chest is distended and barrel-shaped at the upper part, but retracted at the base. The physical signs are practically the same as in adults; the heart beats more in the epigastrium, and the liver and spleen tend to be thrust downwards, whilst the percussion note is drum-like, and wheezy sounds are heard, with weak, high-pitched, often harsh breathing. Asthmatic paroxysms are frequently associated. Of the relation of asthma to scrofula I am in some doubt, though some authors speak positively on this point, and regard the paroxysmal dyspnœa as the effect of large mediastinal glands. Emphysema is very likely to be associated with chronic bronchitis. Of the interlobular emphysema, which is like true surgical emphysema, but little need be said; it may lead to emphysema of the mediastinum and sub-fascial connective tissues of the neck and to pneumo-thorax. (For an instructive paper on emphysema and pneumo-thorax in relation to tracheotomy and artificial respiration, see Dr. F. H. Champneys' papers in the "R. Med. Chi. Trans.") The occurrence of *acute distension* in the course of bronchitis, hooping cough, and the like, cannot alter the treatment of these diseases, though their occurrence should be taken as an indication for supporting the patient, relieving his cough, and stimulating the respiratory centres and circulation so as to combat any sense of shortness of breath which may be attributed to it.

Subcutaneous emphysema may occur in the neck, and even spread over the whole body of children as the result of severe coughing; the skin would be of normal colour. It may be associated with pneumo-thorax.

I have never seen a case of interlobular cervical emphysema which required special treatment; it has been recommended to puncture the skin and let out some of the air and to infrict oil into the skin over the emphysema with a view of promoting the absorption of the air. If pneumo-thorax should occur it had better be left alone, and trust placed in stimulants to relieve the present distress; some recommend aspiration and puncture, but these should not be practised unless the distress be very urgent.

Of *persistent emphysema* the *treatment* should be the same as chronic bronchitis. The signs of ancient rickets often coexist in greater or less degree. Treatment aimed at the preservation of health and the prevention of catarrhs and digestive derangements must be specially insisted upon. Such measures may prevent the catarrhs from keeping up the emphysema. It may be hoped that the climatic treatment, together with the employment of measures calculated to increase the powers of the neuro-muscular apparatus, to promote the intimate nutrition of the tissues of the body generally, and of the lungs in particular, by cod-liver oil and steel wine, will effect all that is possible on the surface of this earth. Mountain air with a low barometric pressure is considered by some to be injurious to cases of emphysema, whilst the surface of the sea with a high atmospheric pressure is recommended. I have certainly seen two cases of chronic bronchitis and emphysema immensely benefited by a stay of six months at Davos. An elevated dry inland air in England may suit quite as well. Rarely does a moister atmosphere at a lower elevation suit bronchial asthma. The great want is perfect freedom from pulmonary irritation. Irritation may come from without and from within. That which is an irritant in one individual may not be in another. *Catarrhs* are promoted, perhaps, as much by irritation arising in the blood (as the result of the imperfect performance of the ex-

cretory and other functions of the liver, skin, kidneys, and alimentary canal) as by irritation due to chills, sudden variations of atmospheric moisture and temperature, clouds of dust, or the more insidious dust of apartments and houses. Not only is internal and external irritation to be prevented, but the internal and external conditions of healthy existence must be of the best possible kind that can be obtained.

The *appetite* may need stimulating by gentian and alkalies, by alcohol or by tonics, such as nitric acid and bark; the protoplasm of the body may work better under the influence of cod-liver oil, arsenic, and other tonics.

The *skin* may be kept in a healthy state by careful clothing in woollen combination garments, the hands and feet being kept warm. The sweat glands of the soles and palms are two of the most important agents in excretion, and possibly in the maintenance of body temperature. Bathing with tepid or cold water, so long as a reaction is obtained, will also further the health of the skin, and friction with rough towels is valuable in filling the arteries and emptying the veins. The use of light dumb bells and circumduction of the arms from before back, or throwing the shoulders back, increase the power of the muscles of respiration, and expand the lower half of the chest whilst strengthening the spinal muscles. The nerves, muscles, heart, lungs, skin, kidneys, liver and intestines are all influenced chiefly for good by active exercise in fine weather out of doors; but the fatigue point must not be reached. Exercise acts not only by improving the circulation, but also by direct stimulation of all the functions. Naturally the exercise should not be such as to tax the right ventricle of the heart, though this will doubtless in time "train on," and the circulation through the lungs be promoted.

The **paroxysmal asthmatic attacks** are usually relieved by the above measures, and especially by the discovery of a

suitable climate. If they should occur, the treatment that is adopted for adults answers also in children, who are mostly not younger than the commencement of the period of second dentition. I have found the tincture of lobelia in ten-minim doses t.d.s., jacket mustard poultices, fumes from nitre papers or Himrod's powder, capsules of nitrite of amyl, the bronchitis kettle, and stimulants of brandy, occasional emetics of wine of ipecac. ʒi. every ten minutes—when the cough is hard and dry and there is much struggling—or a rapid purge with a large dose of jalap, to form a sufficient armamentarium. The child should be kept in bed during the acuteness of the attack. Pyridin might be tried, but its employment would require much caution; half a dram might be evaporated on a dish in a corner of the room, and the vapour inhaled by the patient in bed away from the evaporating liquid.

The regulation of the hours at which the meals may be taken is as necessary as the regulation of the bowels. The attacks are often nocturnal, then the supper should be light, and consist of a cup of milk and a little custard. The principal meal should be at one or two p.m. The child should rest after its dinner, which, though substantial, should never be a big square meal. A meal of the latter description often evokes an attack, and is one of those internal irritations that are so provocative of catarrhal asthma. The meal not only surcharges the blood, it irritates the gastro-enteric nerves, and probably works reflexly on the lungs also. Excess of sugars and starches are sure to lead to fermentations and acidity and internal irritation. Besides lobelia, belladonna and stramonium may be employed as sedatives, ten minims of the tincture of either of these three or four times a day. The stramonium leaves may be smoked, or the extract of stramonium may be given in half-grain pillules.

**Genuine asthma** often begins in childhood—even during early infancy; rickets may make it, as rickets makes

spasmodic croup, fits, tetany and other neuroses. Catching cold, indigestion and constipation are the chief exciting causes of a paroxysm which has pretty much the same characters as that of the adult, though the spasmodic paroxysm is less marked during the first two or three years of life. Urticaria, eczema, asthma, rickets and gout are frequently associated together in the same individual or in the same family; some members may have urticaria and rickets, others eczema and gout, others asthma and gout. A child may exchange its old urticaria or eczema for some new asthma, or old croup for new asthma. The bronchitis of the spasmodic attacks is apt to prove obstinate to treatment, and emphysema may ensue. The character of the attacks is apt to change about the period of puberty; the disease may practically disappear at this age.

The **treatment** consists in the avoidance of exciting causes. *Sea voyages* are very beneficial. Cod-liver oil and arsenic should always be prescribed. Other tonics may be given as for scrofula.

Two grains of iodide and five of bromide of potassium may be given three times a day an hour after meals as alteratives to diminish the liability to attacks.

The *climate* suited to the individual case should be discovered, and a long residence therein recommended. In those cases called "bronchial asthma," the sequence of repeated bronchial catarrh, a seaside climate, like Bournemouth, which is warm in winter, is generally the best.

The treatment of attacks is most unsatisfactory, and should be compared to the treatment of chorea; asthma may be imagined as chorea of the bronchial muscles. Nervine tonics or sedatives, anti-spasmodics, diuretics, diaphoretics, emetics and purgatives are good.

Tea and coffee should be avoided in children, as likely to increase the abnormal discharging tendency of the nerve

centres. A mustard emetic, a saline and calomel purge and sweating doses of nitrate of pilocarpine, with rest in a warm bed are my first recommendations.

The general treatment for bronchitis should be carried out.

**Lobar Pneumonia.**—The resemblance between lobar or croupous pneumonia in the child and adult is fairly close. The difference between the disease in infants under two years of age and adults is fairly great.

The younger the patient is the more frequently do convulsions replace shivering at the outset of the fever, the more likelihood is there that severe cerebral symptoms of the comatose rather than of the delirious type, and the less chance is there that rusty sputa will be seen.

The onset of primary lobar pneumonia is nearly always sudden, with high fever, headache, often vomiting and rapid prostration. The duration of the fever, which usually terminates suddenly, is about seven days. Epistaxis is not unfrequent. A short hacking cough and hurried breathing (60 per minute), the pulse-respiration ratio (two to one, instead of four to one) being disturbed, perhaps expiratory respiration, with hot pungent skin, are valuable signs in the diagnosis. There may be severe pain in the side. Sometimes the head symptoms are the most prominent features of the case—"*cerebral pneumonia*"—but they usually subside after two or three days, when the lung consolidation has fully developed.

*Apex pneumonia* is fairly common in young children; it is not attended with special dangers in them, although severe head symptoms and delirium occur more frequently with it in adults.

Double pneumonia may occur in infants; it is a very serious disease, usually attended with coma; but death, though common from it, is less common than in double pneumonia

in the adult. Delirium of speech does not occur in infants under two years of age, suffering from severe pneumonia; loss of any speech they may have is most common. Sometimes bowel symptoms—diarrhœa—attend the onset of pneumonia, and may make one think of typhoid fever and gastro-enteric catarrh, both of which may begin promptly with high fever and headache. But the hurried breathing, short, single cough, flushed cheek, early delirium and altered pulse-respiration ratio, are usually adequate for the diagnosis.

*Herpes and jaundice* may occur as in adults, and so may the other complications or sequels. As to the physical examination, bearing in mind what has been written in the introduction to the section on Respiratory Diseases, but little need be said. The greatest fact of clinical importance is that percussion and auscultation may fail to say for certain whether it be solid or fluid causing the dulness and altered breathing. Usually the dulness in pneumonia is less marked and less resistant than when there is fluid effusion. The breathing in consolidation from pneumonia may be perfectly tubular, or simply very weak. (See Pleurisy and Empyema.)

Cases may be met with in which all the symptoms, including the mode of onset and termination by crisis, occur after the usual duration—five to eight to ten days—but in which no physical signs have been detected—*masked pneumonia* in which the consolidation is probably central, and surrounded by healthy lung parenchyma.

On the other hand, latent pneumonia may occur in the course of *other diseases*. In these cases the symptoms are masked, but the physical signs often typical. Careful examination will usually reveal an increase in the number of respirations, and perversion of the normal ratio between the pulse and respiration. The *treatment* of them must be in accordance with the febrile, renal or rheumatic disease, which they complicate; this treatment will almost necessarily be of

a stimulant kind; renal pneumonia is a very serious complaint. (See Renal Diseases.)

Pneumonia, like rheumatism, tonsillitis, laryngitis and nervous diseases does not protect from, but rather predisposes the patient to another attack. This emphasizes the necessity for keeping away from all those influences which may induce or predispose to the disease. Although lobar pneumonia is sometimes epidemic, and may be due to a pneumonococcus, there is scarcely any need to isolate the patient strictly; though it is decidedly for his benefit that he should be put in a room apart in the least noisy part of the house. The hygiene of the room should be perfect in every way, like the room used for fevers. The cot should be kept out of the way of draughts, and this is best secured by using the tent-bed. Constant nursing of young infants increases the expenditure of energy and tends to increase exhaustion; they should be kept in bed, as a rule, in the horizontal posture; struggling with an infant only increases the chances of death from exhaustion.

The great principle of the treatment of pneumonia is to bear in mind the tendency to death from neuro-muscular prostration and cardiac failure. To take blood from the veins can seldom be productive of good. Even comatose infants with double pneumonia would probably not be saved by depletion. Ice bags to the head, and hot mustard baths to the body certainly seem to brighten the child, at least for a time; such cases if they escape the Scylla of coma, fall into the Charybdis of collapse, and I place them side by side with cases of malignant acute specifics, from which the diagnosis cannot always be made this side of death.

For an ordinary case, say in a boy five years old, the expectant treatment answers all that is necessary. The child should lie down on his side in bed; he should be fed whilst in this posture, at regular intervals and all his wants

assiduously supplied so as to demand from him the least possible expenditure of force. In asthenia a frequent change of posture may prevent hypostatic congestion. Prostrate children should be moved with great gentleness and caution, lest syncope or convulsions supervene; every active movement of the patient should be prevented.

*Restlessness* and *delirium* may be treated by the ice bag or sponging the skin with tepid or cold water, as the patient lies on the mackintosh; or by rolling in a wet pack, or placing on a cool water-bed. By the same means sleep is often procured. A dose of opium (chlorodyne ♏v.) is valuable and may be repeated if necessary; or half-a-dram of syrup of chloral and five grains of bromide of ammonium. Restlessness may be traced to a loaded bowel; the tongue may be more than usually furred; then a dose of castor oil repeated every day or other day may put the nervous system in a more favourable state. Repeated powerful purgatives reduce the strength, and should not be prescribed. A *very hot skin* may be relieved by sponging. A *diaphoretic* of liquor ammoniæ acetatis ♏xxx. every four hours, with some camphor water, or five grains of citrate of potash, t.d.s., in aromatic water, may be ordered for a child five years old.

*Stimulant expectorants.*—The entertainment of the idea that pneumonia indicates carbonate of ammonia is erroneous. As a general and respiratory stimulant, it may not be needed, or may be contra-indicated by a hard, dry cough. Give it when the stage of redux crepitation sets in; it then promotes expectoration, and doubtless aids absorption. One grain is the dose for one year, and two for two years, given in aromatic water and syrup of tolu every four hours; three grains may be given after five years; four grains is an adult dose; in cold milk it is generally well borne by the stomach.

*Thirst* is best relieved in infants as others by small doses (℥i.) of cold filtered water, or the child may be sensible

enough to suck ice; it is bad doctoring to refuse water to a child; the doses should be small and frequent so that they may be absorbed; screaming and restlessness may subside suddenly after a drink of cold water; taking water out of the system by way of the skin—diaphoresis, however produced—may curiously cure thirst.

*High fever*, which usually goes with restlessness, is best reduced by the use of cold water. Quinine is often given for this fever; it does no harm, but I seldom use it; it may be given in five-grain doses to a boy five years old, and repeated.

The *diet* during the fever should be liquid—mutton broth, weak beef tea, milk and barley water in small doses frequently. Absolute starvation at the outset is not necessary. When the temperature falls, or is about to fall, care must be taken to support the patient by more nourishing food (meat juice, eggs, strong beef tea), and if necessary stimulants (brandy). The indication for stimulants is a very rapid pulse, especially if irregular in force and rhythm and out of proportion to the temperature.

*Pain* in the side, causing restlessness or complaint: hot spongiopiline frequently renewed, hot fomentations—covered with oil silk of course—or poultices, the former more difficult to apply, and the latter, though comforting, dirty, and only to be trusted to a skilled nurse or her equivalent. When the hot applications are finished, wrap the affected side up with cotton wool till convalescence is thoroughly established. Instead of the hot and moist application to the side, some doctors prefer hot bags of sand and brand—*dry heat.* Others use with equal success cold wet compresses, or even ice bags to the side. Ice bags are very good indeed as anodyne, antipyretic and antiphlogistic.

*Troublesome cough* is relieved by the spray of carbolic acid, especially when resolution is taking place and the signs of bronchitis are present. In the earlier stage the short hacking cough is abated by depressant expectorants, and five drops of ipecacuanha may be added to the Liq. Amm. Acet. ℥xx. for a child of three.

Spiritus ætheris nitrosi, as a diaphoretic and diuretic, goes well with it.

A few drops of Tinct. Camph. Co. and bicarbonate of soda may be introduced to lessen gastric and cerebral irritability.

℞ Vini Ipecac, ℥v.
Sodæ Bicarb., gr. iv.
Spt. Æth. Nit., ℥v.
Tinct. Camph. Co., ℥v.
Aq., ʒii.

every four hours.

An ineffectual cough is a sign of increasing asthenia and asphyxia; it must not be quelled by opium; steam and stimulants are most suitable.

Should *diarrhœa* be present it may be often controlled by a teaspoonful of castor oil. If it continue after this the food should be given cold, and a thin starch enema, ʒi., with ten drops of laudanum thrown into the rectum of a child five years old, is the best treatment. Chalk and catechu mixture, with aromatics, may be used if required.

℞ Tinct. of Catechu, ℥xx.
Spt. of Chlorof., ℥x.
Mist. Cretæ, ʒiii.

for a child five years old. (See the treatment of Diarrhœa.)

*Blood-letting.*—The question arises at times how to relieve a patient whose pulmonary circulation and right side of the heart is engorged and overloaded, as the effect of the obstruction to a large area of the pulmonary capillary circulation by the fibrinous exudation. If the lividity be great, and the distress evident in the recession of the supra-sternal and supraclavicular fossæ, and imperfect inspiration, the removal of two or three ounces of blood from the arm of a child five years old, suffering from primary lobar pneumonia, will do wonders, as I have myself seen. It must not be repeated. Stimulants would fail under these circumstances, and the obvious method is to unload the venous system and the right side of the heart. Remember that unloading the right ventricle and stimulating the same, though seemingly antagonistic measures, are really not so. A full bounding pulse, severe pain, wide extent of dulness, should not be treated by blood-letting; nor acute pneumonia at the outset, even in healthy children. The only occasion is the imminent danger referred to already.

Dry cupping and leeching over the inflamed area when the pain is severe, temperature high, and the pulse bounding, is still practised by some—two or three cuppings, or two or three leeches. I have seen this

give relief or be followed by relief, but think it unnecessary; a wet pack or aconite relieves the circulation and nervous system more efficiently; moreover, children with the sthenic symptoms mentioned are half way on the road to collapse; it is the excitement preceding paralysis. I prefer ice bags to dry cupping or leeching.

*Antimony and calomel*, either in large or fractional doses, as rapid depressants or more continuous antiphlogistics, are now utterly and justly condemned.

I have hinted at the development of *collapse* at the critical period of termination of the disease; sometimes delirium may occur in children of some years of age at this epoch; it indicates the necessity for free stimulation, and the pulse should be narrowly watched.

*Convalescence* is promoted by the employment of bark and of iron wine if there be anæmia, and by judicious feeding.

℞ Ext. Cinch. Liq., ♏iii.
Spt. Chlorof., ♏iii.
Glyc., ♏x.
Decoc. Cinch., ʒii. t.d.s.

Children often cry for food after the crisis has occurred, but for them to be allowed to partake of a large meal—say of potato or bread-and-butter—is very bad nursing. A little fish may be permitted on the first day, and a little custard the next, and so the ordinary food may be gradually acquired by successive stages. The scientific reason for this staircase method is that the digestive glands take a day or two to return to their full activity after the departure of so severe a fever; if food be too abundant or unsuitable, irritation and intestinal catarrah may follow.

*Salines*, diaphoretic and diuretic, are commonly prescribed in all cases of fever. They are unobjectionable, but in many cases entirely superfluous. Two grains of citrate of potash every four hours in camphor water or plain water, may be given at two years of age. A scanty urine may be treated by it, and by sweet spirits of nitre.

*Quinine* is another drug in common use in pneumonia. It is antipyretic and antiphlogistic and very valuable, but unnecessary in the majority of cases. In grain doses during convalescence, and with a few drops of mineral acid, it may be more frequently needed.

Blisters are now almost never used. Mustard foot-baths are better derivatives, or mustard poultices, composed of one part of mustard to four of linseed, to the chest. The skin must be protected by muslin over the mustard. The charta sinapis, for ten minutes at a time, and

renewed every few hours according to the pain and dyspnœa, is equally effective as a counter-irritant, and consummately cleanly.

## PLEURISY AND EMPYEMA.

It is not true that all serous effusions tend to become purulent either in the child or in the adult. I have drawn serous fluid from the same side of the chest of the same child at an interval of six months, and I have done the same thing in adults. The most important matter is a difficult one, the determination of the solid or fluid nature of a chest lesion. This is frequently a physical impossibility, by which is meant that physical examination will not avail. There are cases in which neither the history of the case, the present symptoms, or the physical examination—all put together—will enable a diagnosis to be made. The hypodermic syringe, or better, a special exploring syringe must command the very highest position as a method of physical examination; its authority is not unimpeachable; it may say No when there is fluid effusion, and sometimes it says Yes when the lung or bronchi must have yielded the dram of pus that is never after got again. No age is exempt from simple pleurisy; why pleurisy and empyema are most frequent on the left side and croupous pneumonia on the right is an unsolved problem.

Of the *plastic* pleurisy which usually complicates pneumonia and tubercle, nothing need be said, as, with the exception that the pain and cough may require special consideration, the treatment of the pleurisy merges into the treatment of the disease which it complicates. Occasionally the pleurisy of scarlet fever remains without effusion; generally this fever must be regarded as one of the most frequent causes of purulent pleurisy or empyema. That some cases of serous effusion are due to suppressed or masked rheumatism is undeniable; the idea of rheumatism as a cause should be harboured before we invoke the aid of vaguer causes, such as impure air and chill, both of which

may, however, be efficient. Bursting of abscesses or other morbid products into the pleura is a not unfrequent cause of pleurisy in children. Sero-sanguineous pleuritic effusion rarely occurs in children. In one case in a boy aged six there was no cause for it that could be made out; he remained under inspection twelve months, and appeared to have recovered his usual health before the end of that period. Other cases are associated with sarcomata and tubercles. I believe the new formed vessels in the lymph of infantile pleurisy, pericarditis and peritonitis bleed more easily than these vessels in adults.

The onset of pleurisy may be rapid, and signified by the occurrence of some few symptoms, such as chilliness, pain in the side, headache, restlessness or a feeling of distress or malaise having a definite mode of commencement, and for which the child can give no explanation.

Latent pleuritic effusion is not unfrequent, the first symptom being shortness of breath on exertion, or feverishness, or there may be nothing to attract attention except the disappearance of the appetite.

There is usually some *fever* which does not often reach above 102, and subsides in the course of two weeks, unless the child be highly neurotic, or unless the fluid become purulent. In the latter case—empyema—the fever may go on for some four weeks, and then may almost altogether disappear, unless the child be scrofulous or some complication arise. In the scrofulous an empyema may continue to excite fever, of a hectic type. The pleuritic effusions which occur in the cachectic or greatly debilitated may be altogether apyrexial; the centres governing the body-heat seem to have shared in the general cachexia, and no new lesion seems capable of moving them from their low ebb of existence. The breath may be short, but there is usually no derangement of the normal ratio between the respirations and pulse. The

cough usually occurs as short, single, dry and hacking expirations. A long-standing empyema may cause marked clubbing of the ends of the fingers and toes and of the nose; great sallowness and opacity of the complexion; anæmia with emaciation; a harsh and dry skin, which may sweat profusely at times, especially about the head, palms, and soles; these regions indeed are often moist even when the skin is elsewhere dry; diarrhœa; weakness of the legs, with increased knee-jerks and even ankle-clonus, which may be ascribed to clubbing of the lower end of the spinal cord. A serous effusion may cause slight clubbing of the finger ends, but the congested swollen tips of the fingers and toes are more rapidly produced by empyema than by chronic heart disease or chronic lung disease; clubbing of the fingers occurs with greater frequency and with greater facility in inverse proportion to age.

The *physical signs* of a large fluid effusion are absolute putty-like dulness over the whole side with displacement of the mediastinum and heart; vocal fremitus is rarely available; it is useless *qua* treatment to practise auscultation; a side which is absolutely dull requires the insertion of the hypodermic or exploring syringe, and these explorations should be two or three in number, and afterwards repeated if necessary on subsequent days; a great sense of resistance to the finger and short flat note are signs demanding the use of the syringe; *auscultation* is tantalising, to say the least; there may be tubular blowing or simply very weak breathing, which may have a distinct tubular quality; there may be adventitious sounds, and I do not hesitate to say that I cannot distinguish *for certain* between a sound that originates in the pleura and one that comes from the lung. Coughing may clear away mucus in the tubes, and so be of some value, but the act of coughing may be followed by the disappearance of the sound when the case is one of pleurisy. Displacement of the heart

is a very valuable sign; it is not always easy to say whether the liver and spleen are displaced or enlarged; a fluid thrill may be obtained across an intercostal space in the same fashion as in abdominal effusions.

The signs that tell for empyema as against serous effusion are an opaque white skin, emaciation, long duration, fits of sweating, fever, clubbing of fingers, œdema of the affected side, extra heat of skin there and enlargement of the subcutaneous veins. As will be gathered during the first weeks a diagnosis is only to be certainly made by seeing the fluid in the exploring syringe. As in the adult, empyemas may burst in any direction.

None of the lung consolidations give a duller note than that of fluid effusions, but the note may be equally flat in caseous pneumonia, collapse, fibroid induration and sarcoma of the lung and pleura. Sometimes a dull note of tubular or tracheal quality may be elicited in cases of pleuritic effusion, but it has no special diagnostic value. Genuine ægophony or bleating character of the vocal resonance is highly significant of fluid effusion; but in fluid and solid affections alike there may be increased, diminished or abolished vocal resonance. Some of the most puzzling cases are those of localized or loculated empyema, the pus being limited to a single well-defined area. Exploration with the syringe of any patch of dulness which has lasted more than a week, will usually show the way out of the difficulty. A patch of lobar pneumonia, one of phthisical consolidation or sarcoma, or loculated empyema, may yield identical physical signs. The canon of infantile pathology which inculcates the great tendency to the generalization of disease in children is well illustrated in purulent pleurisy. I have five times seen post-mortem examinations of infants in which the pleura, pericardium, and brain-pan were the seats of purulent effusion; this tendency to spread is greater the younger is the patient.

The **treatment** of pleurisy is best divided into two sections —medical and surgical.

Plastic pleurisy if primary may be treated by confining the patient to bed, so as to prevent the lungs from doing more work than is necessary ; pleural irritation is thereby prevented and the pain will also be relieved. If the pain be very severe, a mustard poultice to the side will often give comfort and act as a *counter-irritant* to the pleural inflammation also. The *cough* may be relieved by a linctus of glycerine ʒss., Tinct. Camph. Co. ɱx., Aq. ʒss., for a child two years old ; it is rarely necessary to do more than the above either for the pain or cough. In older children strapping the side to prevent movement is useful in relieving both the cough and pain. Pain is occasionally agonizing, and may be relieved by a tenth of a grain of morphia injected over the seat of pain, or by a full dose of Dover's powder, say five grains, for a boy five years old. In the early days of serous effusion rest in bed and local applications, either icebags, cold wet compresses, fomentations, or poultices may be the treatment. The withdrawal of enough fluid to make the diagnosis is often sufficient to start absorption of the fluid. When all pain has subsided, further attempts at promoting absorption may be made by iodine painted on the surface of the affected side over the whole area of tenderness and dulness ; the iodine liniment may be used as a stronger application than the tincture, though the latter may answer all purposes in some children with a delicate skin. The skin should be kept sore by this means, the iodine being renewed every other or third or fourth day as may be judged in each case ; slight vesication is the most that should be caused. I never use actual blisters or blistering fluid, but if the blistering fluid does not vesicate it is as useful though more dangerous than the iodine. Restriction of the amount of fluid taken in the twenty-four hours (dryness of diet) is an important means of promoting absorption of a

pleural effusion. If possible, the child should not take more than ten ounces of liquid in the twenty-four hours; this is a little cruel at the time, but if it can be persevered in may be very successful; for infants under the age of twelve months the amount of fluid must necessarily be larger; it is customary also to give five-grain doses of iodide of sodium or potassium three or four times a day in the decoction of cinchona ʒii. to a child five years old; in some cases the fluid is rapidly absorbed under this treatment; there are other effusions which hang fire, and yet again others which become purulent.

In children who are already debilitated or cachectic, the absorption of the fluid effusion by means of *sweating* and *purging* is not good treatment, unless the agent which causes the sweating or purging be also tonic to the heart and nerves. Sweating, whether produced by the hot-air bath, by frequently repeated dram doses of the Jaborandi infusion, by $\frac{1}{20}$th grain doses of pilocarpin under the skin, should not be employed unless the boy is fairly robust, the pleurisy primary, and the heart not greatly encumbered. Purgings, too, should be avoided for the reason that they reduce the strength. At the same time the bowels should act once or twice a day, if necessary by castor oil or liquorice powder. Tincture of digitalis in minim doses every four hours, with three grains of acetate or nitrate or citrate of potash in a teaspoonful of water, may be given as a diuretic to a child three years old if there is any objection to removal of the fluid by aspiration.

*Indications for aspiration.*—An effusion which has lasted two weeks, and in which all acute signs have disappeared, requires aspiration. Actual want of breath whilst the child lies in bed—as indicated by the puffy face, sensations of the child, hurried respiration, choking cough, extreme pallor, or slight lividity of lips and nails—is an urgent demand for aspiration. Such cases may succumb suddenly from over-taxation of the right side of the heart. Sometimes syncope

is suddenly induced without warning either the patient or the doctor by any of the signs of dyspnœa ; therefore any large or rapid effusion must be aspirated.

*Method of aspiration.*—The aspiration of a serous or a purulent effusion should be performed as follows :—The patient should be lying down on or towards the sound side. The apparatus, and especially the trocar and cannula, must be rendered perfectly clean and aseptic by boiling water and carbolic acid 1 in 20, or corrosive sublimate 1 in 500. The skin over the axilla, where the puncture is to be made, should be cleaned in aseptic fashion. The needle should enter the lower part of the 6th or 7th space in the mid-axillary line. The bottle should not be made a perfect vacuum to start with. Indeed, two or three strokes of the piston are all that I use at the commencement. The fluid from the pleura does not then spurt into the bottle, but flows in a remittent fashion in harmony with the respiratory movements. The slow withdrawal of the fluid is the best safeguard against such an unfortunate occurrence as sudden death from syncope or cerebral embolism, the results of disturbances in the circulation due to the sudden or rapid removal of pressure. The fluid need not be withdrawn to the last drop; a hacking cough usually comes on ; then the aspirations should generally be stopped; spitting of blood or the slightest sign of distress should be met by the administration of stimulants and the withdrawal of the needle. In the insertion of the needle it is best, though not always necessary, to give an anæsthetic ; the smart introduction of the needle is attended with but little pain. The needle should not be entered further than is necessary ; as soon as the first plunge has been made through the parietes the trocar should be withdrawn to see whether the fluid flows. If it do not, the cannula may be pushed gently further in; if still no result, the trocar may be reinserted, care being taken to prevent the entrance of air.

*Non-escape of fluid.*—The fluid may not escape (1) because false membranes are pushed in front of the orifice of the cannula; (2) a flake of pus or cheesy matter may block the needle. A second and sharper plunge to a greater depth may overcome the obstacle presented by false membranes.

In order that the fluid may escape, it is necessary that the space which it has occupied should be taken up by something else. This something may be some compressed lung expanding, the ribs falling in, or the diaphragm rising. If neither lung expands, ribs retreat nor diaphragm rise, then escape is impossible. This difficulty is of rare occurrence; it is seen in my experience in old cases of empyema, in which there is considerable retraction of the chest-wall and a hard, fleshy lung. It may be that the aspiration will require repetition; this should not be done at less intervals than a fortnight, provided the above-mentioned serious indications are not present. After aspiration strap the side up in strips of plaster and continue the bed, the dry diet and the iodide of potassium mixture. When all effusion has gone the physical examination may show retraction of the side (an angularity of outline which fits well into the space between the outspread fore-finger and thumb) with spinal curvature, concave towards the retracted side, and some even considerable dulness, weak breathing and weak vocal fremitus. If fluid be absent, as ascertained by explorations, and there be no fever or pain, the boy may go to the seaside with a tonic. Exercise in the open air, at first gentle, and gradually more vigorous, will usually expand the lung, remove the spinal curve, and diminish the dulness and weak breathing, until finally every physical sign and subjective symptom may disappear.

*Climatology* is an important item in the convalescence and final cure; dry and bracing sea air is the best tonic; it should not be too bracing if the circulation is feeble; the east coast

is suitable in summer, say Cromer, Southend, Broadstairs, Folkestone, or Margate.

The **principle of the treatment of empyema** consists in recognizing with evident earnestness the urgency of the demand for evacuating the pus. Thin laudable fluid, aspiration, if repeated twice or thrice at intervals of a week, may succeed in evacuating; the evacuation must not be too rapid when the pleura is over full, lest syncope supervene. *A large empyema wants immediate incision.* I confess to a dislike to aspiration after the second time. Pus is dead tissue and deadly; therefore away with it. There is nothing like a free opening—not as wide as a church door, but such as will suffice—into the side under strict antiseptic precautions—Listerism with the spray, and with every attention to minute details; the incision should be made in the midaxillary line about the seventh space; it may have to be made elsewhere in some cases; occasionally *two openings* may be necessary, but not often. Free drainage is the desideratum. False membranes must be removed completely. Occasionally, indeed, the empyema seems to be mainly composed of these solid exudations of variable and varying consistence. Resection of ribs is requisite if the ribs are close together, or if a single opening in the axilla does not permit of free drainage; resection of one, or two, or three ribs (Œstlander's operation) over a space of two inches more or less, according to circumstances, must be performed. This is a fundamental necessity in chronic empyemas with retracted side and hard tough lung. Whatever surgical measure is necessary for the establishment of perfect drainage, that should be done, and the surgeon should be allowed a free hand. The physician is merely to watch the pulse, tongue, temperature, and nervous system. He may gauge the strength better than the surgeon, but he must not meddle with the latter when

he has given the order to make free drainage. The perfection of the drainage of the abscess will be seen in the gradual, often speedy, diminution of the discharge, in the filling up of the cavity, in the disappearance of fever, and in the process of increasing weight and colour of the child. The avoidance of a permanent fistula and of a collapsed lung are paramount considerations. The varieties of *drainage tubes* are numerous, but these and other questions should be left in the hands of the surgeon who is called in to the case. One word about the *washing out* of the pleura. It should never be done in any simple case as a routine measure; in simple cases the free drainage is sufficient; if there is *fœtor* the surgeon may clean out everything in the pleural cavity, and use aseptic lotions at the time of the great operation, but these are not often necessary after the hole has been rightly made for drainage. *Fœtor* is a sign not for aseptic lotions, but for further surgical interference. It may be due to necrosed ribs, which should be resected, or to pent-up pus, which must be got out, or to putrefaction of lymph which requires removal. The washing out of the pleura has several times led to sudden death from coma or syncope. Repeated washings with carbolic acid have led to carboluria and nervous symptoms dependent on the carbolæmia.

The *evacuation of extreme effusion* has led to suffocation and syncope, doubtless from disturbance of the cardio-pulmonary circulation. A slow and steady escape may be easily secured if the incision be but a puncture; the tension is gradually relieved, and time is allowed for the compensation of the circulation. Aspiration by the slow method may be employed as a preliminary in such cases.

The *site of evacuation* may be variable; extensive empyemas may be evacuated in the selected site; any part of the pleura may be punctured and drained; loculated matter should be removed wherever found. Spontaneous pointing may be

allowed to proceed to bursting, and the abscess be drained from that spot. An opening in the upper front of the chest drains badly, if there is a tendency to pointing or if actual pointing has occurred it should be prevented by axillary aspiration or incision. Pointing at other parts may determine the site of evacuation.

The *removal of the drainage tube* should be effected gradually by shortening daily or every two days; a cavity which continues to discharge, and continues to require a long drainage tube, is a cavity which requires more surgery; it shows that something is unsatisfactory; that the space is not being filled up. The antiseptic dressings should be maintained till the discharge is so slight as to need a dressing but once in four days. The existence of a minute fistula or an inch of drainage does not require more treatment than a little iodoform or boracic ointment.

The *dietary* and *stimulants* must be arranged in accordance with the patient's general state. In primary plastic pleurisy and serous effusions it should be unstimulating and low—a milk diet.

Cachexia, debility or evidence of struma, must be met with a nourishing diet and stimulants. An inflammation in a robust child will be increased by good feeding and stimulation, but diminished in a feeble child by the same measures. The very continuance of the inflammatory disease is dependent on debility. Even in empyema, then, hygienic treatment, such as is described under Scrofula, is most important. In weak children, not necessarily scrofulous, cases of primary pleurisy and empyema have been clearly traced to *bad smells* in their dwellings. A teaspoonful of brandy, two of port wine or four of sound claret with the meals may give appetite, aid digestion and circulation, and effect more good than harm in feeble children with or without empyema. The value of iron and quinine, or liquid

extract of cinchona, in these anæmic and feeble ones is due to their influence as general tonics and hæmatinics. Fancy diet may be ordered for cases of empyema; it may be necessary to prescribe pancreatized food, or pepsin; alkalies and gentian may be needed to give appetite and correct acidity. The profuse *sweating* of empyema disappears when free drainage is established, but it occasionally continues as the result of a habit of the nervous system; a drop of liquor atropiæ for a boy of five will usually check this; it may be repeated two or three times, and should be given two hours before the onset of the sweating. The bed linen should be kept sweet and clean, and the causes of ill odours discovered and removed. The *diarrhœa* of empyema has been regarded as something peculiar; it disappears as the abscess in the pleura is healed, and calls for no very special treatment. An excess of undigested milk in the stools sometimes to the naked eye looks like matter; a grain of Dover's powder with three grains of bismuth subnitrate may be placed on the tongue of a boy two years old, and washed down with milk thrice a day.

Even *lardaceous* disease of the liver, spleen, and presumably kidneys (albuminuria), will pass away when the abscess is healed, and the general tonic seaside treatment has been in full swing for a few weeks. I have seen cases of large liver and spleen, especially the result of Pott's disease, completely disappear without the use of any other measures than sea air, cod-liver oil and wine. Iodides are said to have a special value in being able to cause this disappearance of lardaceous disease.

For the dulness denoting thickened pleura our therapeutics are hygiene, abundance of sea air and exercise, cod-liver oil and iodides, and iodine counter-irritation; rapid change of tissue may be effected by such means.

Cases of empyema convalescing rapidly may be up on the couch before the fire in a week in winter, outside on a sun-shaded balcony or in a carriage in the summer in ten days.

## CHAPTER VIII.

### DISEASES OF THE NEW BORN.

### ICTERUS NEONATORUM.

*Spurious jaundice*, or yellow discoloration of the skin of new-born infants, the conjunctiva, urine, and stools being natural, is due to changes in the hyperæmic skin very much like those that occur in an ordinary slight bruise.

*Genuine icterus* owns many causes; the pathogenesis is still involved in obscurity. It will not be far wrong if those cases which recover are associated with the conditions resulting from the change in circulation and respiration at this period of life. Asphyxia, melæna, hæmatemesis, purpura, sclerema, and œdema neonatorum are massed together as in some way dependent on or associated with feeble vitality and tardy establishment of the lung respiration and its consequent circulatory conditions. Icterus—independent of malformation of liver and ducts—should be taken into this charmed circle. Any circumstance which interferes with the rapid performance of the lung and vessel changes must be regarded as, in some degree, causes of jaundice:—A long labour, premature birth, inherent debility, exposure to cold and damp and impure atmosphere.

Jaundice may result from increased pressure in the portal hepatic system, causing pressure on the bile ducts; œdema of Glisson's capsule may occur and aid in the compression; or there may be deficient tension in the portal capillaries with overloading of the biliary canals, and the difference in tension may lead to a passage of bile into the blood capillaries in the liver. The liver may swell up from congestion and œdema

whenever the right side of the heart is obstructed; this doubtless may happen at birth, if the lungs do not expand properly. Duodenal catarrh, and plugging of the bile ducts with mucus, may conceivably occur soon after birth as the result of a chill or improper food. Syphilitic growths may obstruct the bile ducts soon after, if not at birth. Phlebitis and arteritis of the umbilical vessels with pyæmia from an ulcerated navel sometimes cause intense jaundice. Absence or atresia of the gall bladder and bile ducts, or imperfect development and disposition of the same, is an occasional cause of severe jaundice neonatorum.

The **treatment** of jaundice consists in the prevention of its occurrence so far as that is possible by avoiding delay in parturition, establishing the lung respiration as soon as possible, free stimulation of debilitated ones, placing them in a chamber at a uniform warm temperature, not exposing them to cold, not feeding them improperly, and by keeping the air they are to breathe sweet, fresh, but not cold nor too moist. If jaundice has developed, the necessity for the observance of the above commandments of hygiene is quite as imperative. With their observance the treatment of icterus comes almost to an end. A simple purge, unless the case be syphilitic, is the only drug needed, provided the infant be fed judiciously; half-a-teaspoonful of castor oil will be amply sufficient; three grains of Hyd. C. Cret. may be given once with a view to pouring out some bile into the duodenum, and possibly to dislodging the plug of thick mucus which may be the cause.

In the treatment of jaundice it should not be forgotten that even in incurable cases the intensity of the jaundice varies from time to time. This variation is doubtless due to more rapid elimination at times, and to less rapid formation of bile; partly, perhaps, to transformation in the blood by oxidation. At any rate, our cue lies in such physiological speculations. Promotion of the excretion by the skin,

kidneys, and lungs, and the maintenance of a good circulation, will effect something, and probably remove the tendency to the formation of more jaundice. The greatest care is needed not to chill the soft, spongy skin, and not to lessen its excretory functions and cause engorgement of the internal viscera. Frictions of the whole body with a dry, warm hand may be practised after bidiurnal warm ablutions. The imbibition of a fair amount of fluid would *cæteris paribus* promote excretion by the skin and kidneys. A little brandy (mx.) given in the mother's milk with a spoon may be very valuable in weakly infants. The child should be kept at the breast if the milk be suitable, as it is much more likely to be than any substitute. Nothing else than filtered water or very thin barley water should be allowed as diluents with the mother's milk. If the jaundice be suspected to be of *syphilitic* origin, the infant may be treated as directed at p. 84. The above-mentioned hygienic measures are just as necessary in syphilis. Jaundice associated with *pyæmia*, *peritonitis*, *erysipelas*, *phlebitis*, and *arteritis umbilicalis* is desperate, and requires to be treated on the same lines as above mentioned. Stimulants may be more freely given to support strength; frequently renewed hot moist applications under oil-silk, with glycerine and belladonna may be used for the local inflammations.

## ASPHYXIA NEONATORUM.

The affinities of asphyxia neonatorum and atelectasis pulmonum are close. Simply consider the respiratory apparatus and the change in its venue at birth. A proper state of the nervous centres, including afferent and efferent stimuli; a perfectly free entry and exit for air into the lungs, or for the blood going to and coming from the placenta; a sound diaphragm unimpeded in its action by any mechanical or other cause—these are the necessities for the establishment of extra-uterine respiration. The child may be born asphyxiated

because: the uterine circulation failed either from death or syncope of the mother; prolonged excessive contraction of the uterine walls (from injudicious administration of ergot and obstruction to the passage of the fœtus through the pelvis); or pressure on the umbilical cord. These causes prevent the necessary oxygenation of blood and the removal of the fœtal waste products. The venosity of the blood excites the respiratory centres to action; the diaphragm descends, but only liquor amnii, or if the membranes be ruptured mucus and air may be drawn into the lungs. The respiratory centre is possibly kept from acting during intra-uterine life solely by the efficient oxygenation of the blood going to the brain. The infant may be born partially asphyxiated, in a state of great fulness of the tissues; it may be swollen, hot, and bluish red; such cases are usually hopeful. When the infant escapes from the vagina, with a cold shrunken and blue surface, the hope of restoration is slight.

Every care should be taken to see that no obstruction exists to the breathing, either in the nose, mouth, throat, larynx and bronchi, or in the abdomen and outside the trunk of the infant. The finger should be wrapped in a soft clean rag, and introduced into the mouth, so as to clean out anything that may be there. Turning the infant upside down will also promote the escape of obstructives. Sometimes the tickling of the fauces may cause vomiting and ejection of mucus and blood from the bronchial tubes.

**Peripheral stimulation of respiratory centre.**—Dashing a little cold water over the body, or stinging the skin by a flap from the corner of a wet towel, may wake up the dormant respiratory organ. A hot bath for a few minutes (100° F.), with a tablespoonful of mustard, may effect this result. If the bath alone be not successful, a dash of cold water as the infant is removed therefrom may prove successful. The inversion of the infant may cause the respiratory

centre to act, apparently as the effect of the supply of an increased amount of blood to the head. The faradic current may be applied about the diaphragm and neck, one pole being placed at the back of the neck, and the other moved about the epigastrium and along the path of the vagus. Time must not be lost before careful and deliberate artificial respiration is commenced. Silvester's method is the best (see an instructive series of papers by Dr. F. H. Champneys, in the "Royal Med. Chi. Trans."). It is important to have the head well retracted, and the chin drawn well up, so as to keep the hyoid bone upwards and support the tongue; or the tongue may be held out of the mouth by a pair of forceps. The movements should be regularly performed sixteen times a minute, the arms being drawn deliberately upwards and outwards, and equally deliberately brought downwards and inwards against the soft walls of the thorax. Perseverance for a long time—half-an-hour—is most requisite. It has been recommended to use Howard's direct method in these cases. In this method the chest is compressed by grasping the lower parts with both hands and then letting go, so that the ribs may suddenly expand and cause a kind of aspiration-effect on the lungs within. This direct method is not so efficient as Silvester's or Schulze's swinging movements.

M. Greult has recommended the employment of the hot bath at a temperature of 110° F. It is not likely to do much harm, and certainly seems worth a trial in the cases where the child is collapsed, cold, shrunken and livid.

Whether the asphyxia is the result of extravasation of blood into the brain or meninges cannot be told. Artificial respiration would be likely to do harm, and so would inversion if this were the case. Obviously the question, though of great pathological interest, cannot have any influence on the treatment. The only consideration is to get the paralyzed respiratory centres to work.

## CONGENITAL ATELECTASIS.

At the moment of birth it is necessary that the foramen ovale and the ductus arteriosus should become functionally closed, and the lungs expanded since the place for respiration changes its site from the placenta to the lungs. Asthenia, however induced, or some local condition of the respiratory centres and nerves, or obstruction in the passages, may prevent, partially or wholly, the accomplishment of this expansion of the lungs. The infant is born with solid lungs, an open foramen ovale, and a patent ductus arteriosus; the problem is how to shut the two latter by expanding the former, and opening up the pulmonary arteries. If the respiratory centres or the vagi be damaged, the thing is impossible. If the diaphragm is paralyzed mechanically, or as the result of some imperfection of muscle, likewise the thing is impossible. The costal muscles have but little function at birth. The nerves and the muscles may be all right, but the stimulus which sets them to work may be wanting. The powerful stimulus to the respiratory centres afforded by the deficient oxygenation of the blood is only a proof of the deadness of these centres. The respiratory nerves and muscles may only be weak in proportion as the body is weak, and unable to respond to the stimulus which starts efficient respiration. Lastly there may be obstruction to the entry of air by the mouth, nose, larynx, etc. There are all degrees of atelectasis. Indeed, a want of expansion of the middle lobe of the right lung, the languette, and lower margins of the upper lobes, the lower edges and posterior part of the lower lobes, is frequent, probably, in healthy children for a few days after birth.

The symptoms may vary in degree in the same way. A *grave* case is characterized by shallow hurried gasps, cold white surface of body, blue patches about the mouth, nose,

hands and feet, subnormal rectal temperature, remarkable apathy, rapid feeble pulse, inability to suck, twitchings about the face and limbs, feeble cough and no cry. This terminates in death from asphyxia with its customary coma and convulsions.

*Physical examination* shows that but little air is entering. The breath sounds may have a bronchial quality, and crepitation—"compression rhonchus" may be heard. Recession may be seen of the soft parts of the chest wall, which is very flexible in infants. Dulness not absolute, but having a tracheal quality, may be noted over the atelectatic areas.

The **treatment** consists in attending to the respiratory passages, and freeing them from mucus, &c., by inversion and wiping out of the mouth with a soft rag. Obstruction lower down is removed by emetics of sulphate of copper (gr. $\frac{1}{4}$ to ʒi. water) every ten minutes. Emetics are not to be used without consideration ; they may produce too much temporary exhaustion. Weak afferent stimuli may be aided and abetted by a hot mustard (100° F.) bath, a heaped tablespoonful to the gallon, given for five minutes. Respiration is promoted both by the flow of blood to the skin and brain, and by the direct stinging effect on the afferent respiratory nerves ; all sensory nerves influence the respiratory, the cardiac, and the vaso-motor centres ; *vomiting* sends blood to the respiratory centres.

The majority of cases of atelectasis depend on deficient vitality, in which the respiratory neuro-muscular apparatus suffers. Promotion of the health and action of the respiratory neuro-muscular apparatus is aided by placing the infant in the most favourable surroundings. The air it refuses to breathe should be at a temperature of 70° F. The mechanical nurse is an efficient apparatus for keeping the patient warm, a most necessary feature of the treatment, which is also

conduced to by wrapping every part of its body loosely in cotton wool.

Sucking is impossible in the worst cases, owing to the want of breath and want of muscular strength. Mother's milk, or thin barley water with five drops of brandy, may be *dropped* into its mouth, the head being retracted; or, better, it may be *syringed* neatly into the pharynx; the pharyngeal muscles of deglutition appear sometimes to be too weak to act.

Hot mustard baths may be repeated as often as the lividity and apathy seem to be increasing; the respiratory centres may be afferently stimulated by turpentine embrocations to the chest and throat.

The meconium must be evacuated; any mechanical cause of obstruction to diaphragmatic action, in the shape of flatulence, should be removed. I have used an injection into the rectum of half-a-dram of brandy suspended in thin mucilage; this, besides unloading the colon of its wind and meconium, has a general stimulant action.

The rallying of the infant will need great care to prevent its relapsing; stimulants to respiration must be kept up, likewise the general warmth, the feeding with mother's milk, if possible; the greatest care must be exercised to avoid cold damp air; the air must not only be warm, but free from the effects of overcrowding; its carbonic acid must not rise above that in fresh air; and the organic emanations from adults should not be allowed to contaminate the air supplied to the infant. An hour of cold damp or impure air or an attack of diarrhœa from injudicious dieting, may turn the scale; these infants find that to die is easy, but to live difficult.

### UMBILICAL HÆMORRHAGE IN THE NEWLY-BORN.

As in so many other places in the study of the diseases of infancy and childhood, a great deal of mystery is allowed to hang around the question of umbilical hæmorrhage. For this

mystery there is no need. The causes and pathology of hæmorrhage from the umbilicus in childhood are the same as those of any hæmorrhage occurring from and about vessels ligatured in wounds. Sometimes the ligature slips, and the newly-born bleeds from the vessels in the umbilical cord, or the hæmorrhage may take place after the cord has separated; this may result from imperfection in the healing, changes in the wall of the vessels, or from an alteration in the state of the blood; just in the same way as secondary hæmorrhage occurs in an amputation stump. At times the umbilicus becomes ulcerated, and the vessels participate in the inevitable consequences. The wound may not cicatrize straightway; there may grow up a bunch of granulations which may attain a great size and look like a polyp, and hæmorrhage, not often severe, sometimes comes from these overgrowths of granulation tissue. Fatal hæmorrhage may be associated with intense jaundice, the result of a toxæmia dependent on malformation or absence of the bile-ducts. Congenital syphilis must be credited with the power of so deteriorating the blood as to lead to umbilical hæmorrhage. That this hæmorrhage does proceed from altered blood is shown further by the appearance of extravasated blood in other parts of the body, *i.e.*, a symptomatic purpura may be associated with the bleeding from the navel. I have known the navel to be the seat of polypoid granulations, even as late as the age of three years; it bled frequently all along, but was rapidly cured by snipping the polypus off at its base with a pair of scissors, and cauterizing with nitric acid the incised surface. The *prognosis* of umbilical hæmorrhage depends on its cause. Granulations, as a rule, may be quickly healed. Sometimes it is the granulating surface which bleeds, even when the hæmorrhage is indicative of profound disease; the bleeding then has a serious import.

The **treatment** of umbilical hæmorrhage is exceedingly

simple, but not always effectual in saving life. Mere pressure with a swab of cotton or lint (old practitioners often went for cobwebs and applied this to the bleeding point—I suppose with a view to cause coagulation), or lint soaked with perchloride of iron, often suffices; serious hæmorrhage requires no dallying, and nothing short of mechanical obstruction of the arteries should be tried. Two hare-lip pins should be passed through the wall of the abdomen so as to cross the umbilical vessels, then the calibre of the vessels may be occluded by a figure of 8 twisting of silk ligatures about the pins. A paper on the "hæmorrhagic diathesis" in congenital lues, with special reference to the condition of the small vessels, is contributed by Dr. R. Fischl to the "Archiv. für Kinderheilk," Band viii., Heft i.; the term "hæmophilia neonatorum" is there used.

PURPURA, HÆMATEMESIS, AND MELÆNA NEONATORUM.

The principal cause of hæmatemesis and melæna neonatorum would appear to be the circulatory disturbance caused by the change in the site of the respiratory area from the placenta to the lungs. In some infants this change appears to take place with difficulty, especially when the congenital atelectatic condition of the lungs is not quickly succeeded by fair expansion of the alveoli. Purpura—hæmorrhages into the skin—and epistaxis may coexist. Generally the hæmorrhage takes place from capillary vessels; occasionally actual ulceration, apparently ante-mortem, has been discovered in the stomach and duodenum. Whether hæmophilia, or the tendency which is its chief indication, can be held responsible for many cases of hæmorrhage in the newborn is doubtful; it perhaps is effective in a few cases. Syphilis must be regarded as a possible cause. The bleeding may occur any time within a few days of birth. Hæmorrhage has been known to occur into the peritoneum, either in

combination with hæmorrhage into the alimentary canal or apart from it. Twice a rupture of the spleen with extravasation of blood into the peritoneum has been recorded.

*Spurious hæmatemesis* is the term employed for the vomiting of blood which has descended into the stomach from the infant's nose or mouth. The blood may come from a fissure or ulcer on the mother's nipple, from a cut in the infant's frænum linguæ, or from other parts of the mouth, pharynx, and nose.

The **treatment** of genuine melæna and hæmatemesis in the new-born should be of the expectant kind; the infant should be kept as absolutely at rest as possible; it has been advised to give gallic acid gr. i., liq. ext. of ergot ℥v., turpentine ℥ii., and other astringents, by the mouth, or by injection into the rectum; ice bladders have also been recommended to be placed over the stomach.

The chief treatment besides rest should be *free stimulation* and *warmth* to the surface rather than cold; I have seen but one trifling amount of melæna which got well; the infant, a male, the first-born, was brought into the world after a tedious second stage, and did not cry well at birth; five drops of brandy in the mother's milk every half-hour, and then every hour, were given during the second day after birth, on which the melæna occurred; the stimulants increase the activity of the respiration and circulation, and so bring about the necessary changes more effectually.

## TETANUS NEONATORUM.

Tetanus is essentially an excessive discharge from bulbo-spinal centres which Hughlings Jackson believes to be due to unrestrained cerebellar influence; it is a frequently repeated cord convulsion.

Generally it begins within a week of birth; difficulty of deglutition is usually the first symptom; putting the mouth

to the breast or bottle induces stiffness of the jaw muscles and orbicularis oris; the whole face may be affected with the tonic spasm, and the spasm may involve all the muscles of the trunk. Cervical opisthotonos is common, but not so total opisthotonos. Asphyxia and cyanosis are not unfrequent. The temperature is usually raised to about 100°, and may be occasionally very high (108°) just before and after death. The spasm does not entirely disappear; the spinal centres give more "tone" to the muscles than they should. An absence of screaming is a noteworthy feature, and so is rapid wasting. The pathology and etiology are very obscure. Umbilical phlebitis and arteritis have been seen in some cases. Impure air and defective hygiene, exposure to cold and wet winds, falls and blows, mechanical pressure on the bulb from displacement of the occipital bone are given as causes. Every sudden change in the environment may induce a paroxysm. Avoidance of all peripheral and central irritations is necessary—draughts of air, excess of or sudden lighting, loud noises from door slamming or window shutting, sudden movements of bedclothes, sudden approach of persons or food. The whole body surface should be evenly but only sufficiently covered. Bathing is out of the question unless the infant should be kept constantly in the warm bath to ensure absence of irritation. The bowels should be unloaded by an enema of soap and water, with half a dram of castor oil.

Chloral is probably the best sedative and preventive of the spasms; great care is required in its administration lest it be overdone; it is best to begin with grain doses of the hydrate; it may be given by the mouth if deglutition is not affected, or by the rectum, or better still, by the nasal tube with the food. When the spasm affects the pharynx and gullet, feeding with the soft nasal catheter is imperative; it should be done systematically and with chloroform, so as to

prevent paroxysms being produced by the nasal irritation; the chloral may be given with some of the mother's milk, thin barley water, mutton broth, or whey mixed with ten drops of brandy.

Extract of calabar bean (gr. $\frac{1}{12}$) by the mouth, or gr. $\frac{1}{20}$ under the skin, has been highly recommended; it should be pushed with carefulness to the point of lowering of the pulse rate and breathing.

Preventive and other hygienic management of the infant and mother should consist in the avoidance of falls and blows, of prolonged labour, of dirt and irritation of the navel-string, of uncleanliness of the bed, bedding, and clothing, of over-crowding and impurity of atmosphere or room, and of wet and cold.

The occipital and other bones should be searched for indentations resulting from mechanical pressure during parturition, or from blows and falls. The displacement is said sometimes to occur after birth from pressure by anything on the occiput. If a dent be found, the head must be specially protected from injury or sudden movement; the infant should lie on its side and not on its back when the occipital bone is staved in. Some authors even go the length of recommending surgical manipulation; any degree of force should surely be avoided. Leeches have been applied to the nucha and along the spine, and the spinal ice-bag has been recommended.

Opium, ether, belladonna, aconite, cannabis indica—half-an-ounce of tincture in one day has been given, conium, curare, tobacco, and assafœtida have been recommended or tried.

## SCLEREMA AND ŒDEMA NEONATORUM.

This disease is characterized by the development of hard patches in the true skin; the patches spread in such a manner as to involve large tracts of skin, and, indeed, may form a plastron all over the trunk; the shoulders and buttocks are

usually affected; the colour of this rigid skin is bluish red; a fold of skin cannot be picked up between the fingers owing to the rigidity and thickening.

Sclerema of the true variety may be seen in the first few days of life; a great deal is made of the debility of the circulatory and respiratory organs; most of the cases prove fatal in a few days or weeks. Some of the chronic cases are certainly not weak either in the respiration or circulation; recovery is not uncommon in these cases. Brightness and cheerfulness are good signs also, and indicate a healthful state of the cerebral cortex.* Atelectasis is often found after death; it probably develops slowly during the brief life of the infant. Parrot has observed sclerema in cases of rapid athrepsia; these are not observed in England. The temperature of scleremátous cases is usually low; it may be 90 in the rectum. Œdema of the subcutaneous tissues is described. I do not remember to have seen a pure case; it is closely allied in its clinical relations with sclerema; atelectasis is often congenital in it; the children are usually premature and feeble. The œdema commences a day or two after birth, and generally spreads from below upwards. Firm pressure may leave a pitting; the colour of the surface is not bluish red. In both these diseases, which may coexist, feeble vitality is a great feature, as a rule. Convulsions, diarrhœa, syncope or asphyxia may close the scene.

In œdema and marasmus of infants a few months old, the liver and kidneys may be apparently normal in every respect except consistence: brittleness with preservation of translucency, bulk and shape has struck my attention.

The **treatment** of both diseases consists in wrapping the infants up in cotton wool, and placing them in a warm place; the mechanical nurse or *couveuse* would prove excellent.

* See the *Lancet*, Vol. ii., 1888, and also Vol. i., 1889, cases by the author.

Five-drop doses of brandy, repeated according to circumstances, may be given in a little barley water, veal tea or whey, if the debility be great. Aromatic waters promote digestion. The infants may be unable to suck, and then the food should be syringed into the back of the mouth by means of a short piece of tubing. Inunctions of simple and camphorated oil have been used in cases of recovery. In one case mercurial inunction seemed effective: the spleen was large, and the head hairy; except that the child was the first-born there was nothing else to suggest syphilis; small doses of cod-liver oil were given. A degree of massage with stimulant oils may well be tried. The hard œdema sometimes seen in the feet of cases of infantile palsy is forcibly recalled to my mind in connection with the sclerema and œdema of the newly-born. Warmth is regarded as curative —hot baths, vapour baths, and frictions with warm oil; hot sand or bran bags may be applied to the surface.

## ERYSIPELAS.

Henoch describes erysipelas amongst the diseases of the newly-born; in this he is right, for the disease chiefly occurs within a few months of birth, and is then very severe—mostly fatal; it occasionally occurs after the first year of life; in its general characters it does not differ from the disease in the adult; the face is far less frequently affected. As in the adult, a wound or cutaneous lesion is generally the starting point—eczema of the head and genitals is a common place for its commencement; it is essentially a disease of faulty hygiene. The larynx may be involved by extension from the neck or from the rhinitis and sore places about the nostrils. The disease may be severe, with high fever (105 or more) and brawny swelling of skin; the feeble vitality of infants often proves unequal to the erysipelatous process. Cases of brawny erysipelatoid indurations of the genitals and buttocks

in male and female infants the subjects of syphilis, are less markedly febrile; they are amenable to mercurial treatment.

The only **treatment** should be a stimulant one, and instant removal to the country if possible. Peritonitis is very frequent; its signs may be masked by the general disease; suddenly-developed tympanites is its most important manifestation. Pneumonia, pleurisy, enteritis, and gastro-enteritis may occur because spread of disease is far greater and easier in children. *Stimulants:* Brandy and wine are needed; ten drops of brandy in equal parts of barley water and milk, or wine whey, may be required every hour. Protecting the inflammation from the air and light is *the* local treatment; painting the red surface with glycerine of belladonna, and covering over with lint or warm fomentation, are good. Many topical remedies are advocated, but anything that fulfils the above requirements will do; white lead paint answers the purposes well.

In children above six months, tincture of iron perchloride in three to five-minim doses, with 20 drops of glycerine to 3i. of water, may be given. Iron is useless, in my opinion, for the erysipelas of the newly-born. Hot fomentations or light linseed poultices may be applied over the abdomen or chest when these are the seats of secondary inflammations. Constipation is best treated by enemata, if at all obstinate; avoid any but mild laxatives; in the early stage a small dose of castor-oil is valuable. *Diarrhœa* is rare, and not difficult to treat.

Blisters to the spreading part or in front of it, mercurial ointments, baths of corrosive sublimate, and actual methodical compression have no checking influence.

Compresses of lint wrung out of camphorated spirit, fomentations with lead water, poppy fomentations, and poultices are useful local applications.

A favourable turn and subsidence of erysipelas indicates free *stimulation* still with ammonia and bark and brandy. Quinine may replace the bark, and 15 minims of tinct. quinæ ammoniata may be prescribed every hour, or less frequently. Abscesses should be opened at once, carefully and antiseptically. A dram of glycerine to ℥i. of fresh cold cream is a favourite ointment of Meigs and Pepper; it is smeared over the

inflamed surface several times a day. Cool or tepid emollient applications (linseed tea or barley water) may be used at the same time.

**Tumour of the sternomastoid** generally occurs on one side, and is mostly the result of abnormal or prolonged parturition in which the muscle becomes ruptured and a hæmatoma forms within the sheath; torticollis may result; some cases at least recover without deformity; whether syphilis has anything to say in the causation is doubtful; a syphilitic infant may have the tumour as well as another; infriction of simple oil with the finger, cold compresses, or doing nothing is the usual treatment.

A syphilitic myositis is held to be the pathology in some cases.

**Pemphigus neonatorum** is treated of under syphilis, which is its most frequent cause; other cases occur apparently not specific and more amenable to treatment, which should be hygienic and dietetic as well as medicinal; the palms and soles and scalp are rarely affected in this simple variety.

An excellent account of the congenital malformations of the eyeball and its appendages, by Marcus Gunn, may be read in the *Ophthalmic Review*, July to September, 1889.

# CHAPTER IX.

## DISEASES OF THE CIRCULATION.

THE heart is small in infants; its first sound is less long and less loud; its action is more irritable, irregular and variable; it is more easily influenced by new conditions in the infantile internal or external environment; its apex beat is variable in force and position; it may beat the chest wall in the fourth space and in the nipple line. The pulse is even more erratical than the heart. An irregular pulse is of less diagnostic import in infants than in previously healthy adults. Neurotic individuals often have an irregular pulse; the infant is a born neurotic. Alone as an isolated symptom an irregular pulse possesses no diagnostic value. The blood pressure is low until puberty; the arterial tension is very unsteady as sphygmographic and digital observations show; sudden transient failure of the heart muscle and of the blood pressure is common in childhood, especially so in diphtheria and scarlatina. During puberty the rate of growth of the heart is very great; it may be centum per centum per annum if puberty is established in one year; the relation of the size of the heart to the arteries is also perverted; the infant has relatively wide arteries and a low blood pressure; the adult has relatively narrow arteries and a high blood pressure.

### CONGENITAL HEART DISEASE.

The cardinal symptoms of congenital heart disease, one or more of which may be absent, are: cyanosis, cardiac murmur, clubbing of fingers and toes. Nævoid conditions of the cutaneous veins of the left eyelid, and of the retinal veins on both sides, may be seen in typical congenital cases. The

liabilities of the disease *qua* symptoms are paroxysms of dyspnœa, of palpitation, of convulsions, of diabolical screaming, of stupor or drowsiness, of epistaxis, and other hæmorrhages. A form of spurious cyanosis may be seen in young infants, due to absorption of aniline dyes from newly-marked napkins.

The nature of the malformation or disease can only be guessed at. The commonest lesion is obstruction at the pulmonary artery, with dilated and hypertrophied right ventricle, patent foramen ovale, and incomplete ventricular septum. The blueness of nose, mouth, ears, toes, and fingers is *not necessarily* attended with coldness of these parts; the temperature of the body is mostly normal; the blueness may not be manifest till some days, weeks, or months after birth. Many cases die before the end of the second year; only a few reach 30 years of age.

The *preventive and hygienic treatment* of cases of congenital heart disease is the most important. The avoidance of great muscular exercise and of mental or nervous excitement will do something to stave off the attacks of dyspnœa, palpitation, screaming, and convulsions. The avoidance of cold and damp by the employment of uniform woollen clothing to protect all parts evenly will prevent pulmonary and intestinal catarrh, and so lessen the tendency to further deoxygenation of the total bulk of blood and further loss of vitality. The avoidance of indigestible articles of diet, and of other causes which promote indigestion, will ward off the stupor or drowsiness which is a frequent symptom. Excess of sugars and starches should be avoided, as preventive of acidity and intestinal catarrh. The food must be of a nourishing sort, and if necessary the appetite should be improved, and digestion aided by alkalies, bitters, and tonics. If the attacks of dyspnœa, etc., should come on they should be treated with simple stimulants like brandy, ammonia, and ether; they may often

be best relieved by an emetic, and the bowels should be freely opened with castor oil. I usually prescribe occasional doses of gray powder to relieve hepatic congestion; saline purgatives in the usual doses are also valuable; digitalis is occasionally useful, but not very; probably because the hypertrophy does not affect the left ventricle, on which digitalis probably has most action. Cinchona or quinine may also be prescribed—three minims of the liquid extract or a grain of the sulphate with glycerine or jelly. What has been said of the benefit of fresh inland air applies to children with congenital or other heart disease. Cod-liver oil is always prescribed in these cases with a view to promote nutrition; the growth of the body is nearly always retarded. Care should be taken that the prolonged sitting in one posture does not cause congestion, œdema, and coldness of the extremities. The perambulator should be well cushioned and the limbs evenly covered when the infant is taken out of doors. The skin requires careful cleansing, and should be kept thoroughly acting by frictions; the skin tends to become dry except in the palms of the hands and soles of the feet. But little can be done for albuminuria should it supervene; it generally results from the venous congestion; the erect posture favours it. The skin and kidneys should be kept acting by demulcent drinks of thin barley water, and if necessary hot air baths. The bowels will need careful attention.

Diuretics are useless unless it be digitalis which seldom relieves albuminuria. Sir W. Foster has recommended eight-minim doses of peroxide of hydrogen three times a day as useful to remove extreme cyanosis. Dr. Eustace Smith advises small doses of infusion of digitalis for violent palpitations, and the late Dr. Peacock employed small doses of Dover's powder, which also tend to moisten the skin. Paroxysms of passion—mental epilepsy, are common; they should be guarded against for they often cause great exhaustion.

## ACQUIRED HEART DISEASE.

It is impossible to separate the discussion of children's pericarditis and endocarditis from rheumatism and its allies. What has been written on rheumatism might equally well have been introduced here. The necessity for daily supervision of the heart by auscultation when the child is laid up with an obscure illness of doubtful rheumatoid nature is of the very first importance.

Scarlet fever, measles, and diphtheria are other blood diseases which may give rise to pericarditis or endocarditis, and with descending frequency in the order mentioned. Pericarditis may complicate pleurisy, peritonitis or meningitis. In infants suffering from erysipelas pericarditis may arise, and be difficult of detection. This is an illustration of a canon of infantile pathology which teaches that the perfect diagnosis of disease, always more difficult in children than adults, is far more so the younger is the child.

The *symptoms* of pericarditis and endocarditis may be latent, or there may be disturbance of the circulation, respiration, cerebration and præcordial sensation; there is very little that is special to children beyond what has been indicated in this place and in the chapter on Rheumatism. The great frequency of endocarditis in rheumatism in children is partly compensated for by the greater frequency and proneness for cardiac lesions to disappear at this period of life, and also by the greater and highly remarkable powers of compensation possessed by the myocardium. The tendency for valvular lesions and their attendant murmurs to disappear should be thought of as part of the same general law to which all rheumatic phenomena submit; the arthritic manifestations, the nodules of connective tissue, the erythemata, the chorea have a special tendency to disappear and to return at uncertain periods. Truly there must be a rheumatic diathesis whose

active manifestations are for the most part suppressed in the life of the individual; frequent explosions occur, sometimes apparently spontaneously, and at other times on the slightest exciting cause; these explosions are sometimes obscurely connected with one another by smouldering remissive manifestations.

Some of the severest forms of heart disease in children are attended with the persistence of subcutaneous nodules, and in some measure the state of the subcutaneous beads is a guide to the state of their valvular homologues. In some measure, because the local causes which maintain nodules about the elbows are perhaps at times more powerful than those which maintain their valvular companions. The wasting and cachexia, with severe præcordial or epigastric pain which accompany the severe form of heart disease in childhood, deserve special notice. In these cases the dyspnœa often amounts to orthopnœa, hæmoptysis, cyanosis, clubbing of the extremities of the circulation, pleurisy, bronchitis, albuminuria, dropsy, ascites, adherent pericardium, dilatation and hypertrophy, affections of valves on both sides of the heart, may all be observed in the course of one and the same case.

The **treatment** of acute pericarditis and endocarditis is the treatment adopted in rheumatism and other diseases which the cardiac affections complicate. The child should he kept lying down in the recumbent position if this does not increase the dyspnœa. The recumbent position gives the heart least work to do. Simply perfect rest in any position is the most important indication in treatment, the object being not to excite the myocardium to make any effort in excess of the requirements of the circulation, and also to prevent the occurrence of acute dilatation of the myocardium. This leads up to the question of how much force is necessary to maintain a flow of blood throughout the vascular system. The answer will depend largely on the arterial blood pressure

which is a measure of the resistance to the flow of blood from the arteries to the veins. It would seem desirable, therefore, to use remedies calculated to diminish vascular tension.

In *pericarditis*, more than in endocarditis the action of the heart is very frequent, and this it would seem to be necessary to control; I cannot bring myself to think that any cardiac drugs should be employed to effect any depressant action. Sudden dilatation ever haunts one, so that I do not advise the use of aconite, antimony, or tartar emetic in children. Trust to rest in bed, to low diet in the form of weak milk and water and barley water, mutton broth, and the like. The bowels, skin and kidneys should act thoroughly, so that the blood may be kept as pure as possible, and any heightening of the arterial tension due to impurity of blood be thereby avoided. In cases of great restlessness, provided the bronchial tubes are not clogged, and there be not a marked degree of cyanosis, opium may be useful both in quieting the heart, calming the nervous system, moistening the skin and lowering the blood pressure. It may be given as Dover's powder gr. iii., or chlorodyne ℥iii. three or four times a day for a child seven years old. Belladonna tincture ℥x., or drop doses of liquor atropiæ, may be used when the bronchi are clogged; and chloral may be employed cautiously. Bromides of ammonium or sodium are better than that of potassium.

At the same time that a low diet is maintained it may be necessary to administer small quantities of brandy. The pulse and first sound of the heart should be watched narrowly for indications of asthenia. I never use mercury or venæsection. A couple of leeches over the præcordial region may be employed at the outset of pericarditis, no matter what its origin, provided there be not a great anæmia. The best local application is spongiopiline heated by hot water, changed every hour, and covering a large extent of the front of the chest and left side. Every care must be taken to prevent the

surface from being chilled during its removal and application; it is advisable with this end in view to oil the skin well, and to have a layer of cotton wool in readiness.

Having no experience of *cold, wet compresses* in pericarditis, I should not condemn them, as they are used with apparent success in localized pleurisy. Linseed poultices is the favourite local application with some. It is rare that an effusion remains unabsorbed. Should this prove the case it is advisable to confine the patient to bed, even though there be no fever and no disturbance in any other part of the body. The amount of fluid taken in the twenty-four hours should be restricted; iodide of sodium should be prescribed in large doses, commencing with small ones of two grains three times a day for a child six years old. The surface of the præcordia may be *counter-irritated* by iodine tincture or liniment, or by the oleate of mercury, which I used successfully in one case in which the effusion hung fire for a few weeks. Blisters are commended by some. Some tartrate of iron (gr. iii.) may be coupled with the iodide so as to improve the condition of the blood, which often is a cause of the continuance of effusion. If the heart be impeded in its action two drops of tincture of digitalis may be gradually increased; this often acts as a diuretic and indirectly promotes the absorption of the effusion.

Care should be taken in cases of this kind not to shift the patient's position suddenly, lest the sudden movement lead to syncope from sudden myocardial dilatation. Brandy and ammonia may be needed, especially in the early hours of the morning; a nourishig diet is generally required—strong beef tea, minced under-done meat, custards, and good milk. It is possible that *paracentesis* may be required for the removal of serous pericardial effusion. In purulent pericarditis such treatment has been occasionally successful. The exploring syringe should be used first, and with great care. The

puncture is best made in the fifth left interspace, one inch from the sternal border. Of course this should not be done without due deliberation and consultation; skilled surgical aid should be sought.

I do not know of any certain means of diagnosing adherent pericardium in the child, but the severe dragging pain about the epigastrium is very suggestive of this lesion.

The management of convalescence from endocarditis and pericarditis is of tremendous importance. The myocardium is the centre of attraction. How to keep its muscle and nerves in good condition whilst the pericardium and endocardium are being themselves restored by the vis medicatrix naturæ as well as by the physician's art.

Rest in bed should be insisted on with religious fervour; it is easy to divert children in confinement; disease of the hip joint has often confined children to their cots for months and years at a stretch, and this in a recumbent, constant, dorsal decubitus; is not a heart of more importance than a hip?

All excitement should be avoided; romping is radically wrong; sleep should be sedulously sought every night, and for as much of the day as possible; with a physiological paralysis of mind or cerebral cortex the heart does not bound or leap in harmony with changes in the environment; though palpitation from indigestion is more unrestrained during sleep, yet sleep is often prevented by palpitation.

Rest for the myocardium is promoted by general tonics and general sedatives, as well as by heart tonics and sedatives; these may, however, be considered in conjunction with the treatment of chronic heart disease.

The management of convalescent and chronic valvular disease of the heart is a very interesting practical study. The great essential is to maintain the nutrition of the myocardium. This will include not only the regulation of the

diet by which the body and heart muscle are nourished, but will comprise the adoption of all those measures for preventing the occurrence of any accident, however small, calculated to deteriorate either the general health or the health of any organ on which the collective health depends. The conditions of hygiology have been repeated almost to the sickening point, but we must rise once again in this connection, and insist on the necessity of fresh air, with avoidance of cold, damp and impurity; warm uniform woollen clothing, with special attention to the state of the hands and feet, neck and chest; gentle exercise, as in quiet walking; attention to the appetite, digestion, sleep, and the state of the excretory organs, skin, liver, kidneys and bowels. The special condition of cardiac hygiology is, however, the avoidance of any action—nervous, muscular, or glandular—calculated unduly to excite or depress the contraction of the myocardium. A full meal embarrasses heart and lungs, and tells thereby doubly on the right ventricle. Running, walking upstairs, sudden shocks as from receipt of bad news, practical joking, playing excitedly or dramatically, witnessing sensational or tragical plays, tax, sometimes too much, the heart muscle. If the child be of the specially emotional sort it is advisable to let his training and education be accomplished privately, for outbursts of anger from jealousy, attempts at competition either in sports or study or examinations, angry emotions, fright and other disturbances, are all inseparable from the life of a public boarding or day school.

Of *bathing* it must be said that swimming should be allowed only when the lesion has been long at a standstill, and no fresh hypertrophy has occurred for years. It is safest to interdict all forms of swimming, as it is to disallow rowing, cricket, fives, hockey and football. But each case should be studied in these respects on its own features. If the heart

has been in an absolutely stationary state for a long time a moderate indulgence in swimming, cricket, and hockey or fives may be allowed, but not the violent games. Any special training should not be permitted. Ordinary bathing might be practised with the provisions that the shock is not too great and the child has not been recently suffering from want of cardiac compensation. It is very necessary to insist on the fact that cardiac disturbances may arise from causes within the organism ; the causes above mentioned are more thoroughly understood by parents and lay people generally. Rheumatism, being the chief cause of heart disease, must be avoided, not only by preventive means against the environment, but by the avoidance of too much meat, eggs, too much sugar and starchy food; indigestion or overloading of the blood with the products of digestion is a sure basis for rheumatism as for gout.

Any sign of *want of compensation* of the heart's action—cough, dyspnœa, hæmoptysis, paroxysmal or continuous palpitation, indigestion, sleeplessness, emaciation, œdema of feet, and the like—should be promptly met by placing the child in bed for one or more weeks, and treating him or her medicinally and dietetically. The food should be light and nourishing—milk, a little white fish, bacon, custards, bread.

*Iron and digitalis* are the two best remedies. The per-nitrate of iron or perchloride in five-minim doses, with three-minim doses of the tincture of digitalis and half-a-dram of glycerine in a tablespoonful of water, may be given to a child seven years old; other preparations of iron may be better borne, and infusion of digitalis in half-dram doses may effect better results. Sometimes it answers best to give an extra dose of digitalis in the early hours of the morning, when children suffering from heart disease often wake somewhat faint.

If there be anæmia I counsel the employment of the sitting

or recumbent posture ; the child may go out in fine weather in a carriage (see chapter on Anæmia).

Bronchitis and indigestion are treated as they would be elsewhere, care being taken not to employ measures that tend to depress the myocardium.

*Excessive hypertrophy* should not be treated by cardiac depressants, aconite, antimony, veratrium. I feel most strongly on this point. The cause of the hypertrophy may be found in a diseased kidney, the treatment should be directed accordingly. Conceivably hepatic and gastro-intestinal or nervous derangement may have something to say in the causation of the hypertrophy. The indications for the employment of digitalis are the same as in adults—irregularity, frequency, intermittency, smallness of pulse. Digitalis is more generally effective in relieving heart symptoms in the child, and the improvement is often persistent after a course of a month or two of digitaline treatment. Besides special cardiac stimulants ordinary stimulants may be needed in the course of a case that steadily progresses down hill, and when the *pericardium is adherent*, digitalis, in severe heart disease, with smouldering rheumatism, often proves of no value. Brandy and ammonia should be freely given to ward off syncope, which may have to be met by the subcutaneous injection of ether ℥x. or more for a child seven years old.

Attacks of *palpitation* and dyspnœa generally call for attention to the hygiology of the nervous system and digestive apparatus ; they may be traced to excessive reading and head work, or to constipation and indigestible articles of diet ; for their immediate relief diffusible stimuli should be given, as in congenital heart disease.

**Dropsy** in the child is treated on the same principles as in adults. The best diuretics are digitalis, fresh infusion in dram doses, squills, gin or juniper, and the ammonic and potassic acetates. The " dropsy " pill, composed of one grain

of blue pill or calomel, ½ grain of powder of squills, and ¼ grain of digitalis powder, has been effective in removing with astonishing rapidity ascites and anasarca in children. Citrate of caffeine may be used with excellent effect in one-grain doses rapidly pushed, every three or four hours. Resin of copaiva in ten-grain doses in Mist. Amygdalæ Co. is a diuretic of good value in some cases with much bronchorrhœa and cough. The above doses are all for children about six years old. It is customary to "dry cup" and foment the loins when diuretics are being given. Dr. Eustace Smith highly commends ten-minim doses of tinct. of cantharides for a boy nine years old, three times a day.

Elaterium, though not always a reliable preparation, is a very good hydragogue cathartic in children about the age of seven; it may be given in $\frac{1}{20}$-grain doses with sugar of milk. Pulv. Jalapæ Co. (gr. x.) is, however, an equally efficient and safer watery purgative for children generally.

I have occasionally used punctures about the ankles to relieve dropsy in the legs; the legs should be in a dependent posture; the punctures should be made with strictly aseptic instruments, and antiseptic precautions adopted in the form of hot fomentations wrung out of boiling water impregnated with carbolic acid, 1 to 40, or perhaps better still boracic acid. Southey's tubes have also been employed.

Whether there are remedies calculated to remove the fibroid lesions of the valves need not be discussed, and beyond the prevention of rheumatism, and the treatment of it when it arises, I should be content to trust to general measures as above indicated rather than employ such drugs as iodides, bromides, or mercurials (which may develop anæmia), given with a view to promote the return of the valves to health.

## CHAPTER X.

### DISEASES OF THE SKIN.

The skin of children is a very tender sensitive structure. Heat and exercise cause it to swell up and stretch very much more than the skin of adults. Hence there is a greater danger of catching cold from overheating. The large surface of dilated vessels and blood presented to the action of cold is a percentage cause of susceptibility to chills in infancy. The application of cold, too, causes greater shrinking of the more elastic skin, and greater relative emptying of the cutaneous blood-vessels. The skin sympathises with other organs, especially the kidneys, liver and bowels in greater degree than in adults. A skin from which the blood has practically departed is accompanied by portal fulness and paralysis as the enlarged spleen proves: a point of fact of which I have satisfied myself, and in cases in which the spleen was not enlarged as the effect of rickets, syphilis or tubercle. The skin is a great telltale in infancy. Defective alimentation is a great cause of skin disease in children; therefore it is most necessary to inquire carefully and minutely into their dietary. Local irritants of any kind cause greater effects in infants and children. The napkins must not be washed in soda; they should be soaked for hours in weak sanitas or carbolic acid, ℥ss. to the Oj.

The more sensitive any organ is the more readily does it take on faulty or good habits; the habit once established is difficult to break; a skin which itches for one day is more likely to go on itching than one which itched only for one hour; permanence may be secured for symptoms and dis-

eases by the setting up of faulty habits; the residence of this faulty mode of working is as much in the tissues and vessels as in the nerves, though the nerves may lead the way in the acquisition of the habit.

Hot bottles, blisters, hot applications and bandages, are things to be very carefully applied, in view of the tenderness of the infant's skin. A urinous napkin may cause inflammation, even ulceration, of the bottom — the "napkin bottom." The skin must be cleaned regularly, at least once a day, with soap and water, in health. Very cold water should be avoided in infancy; it should not be lower in temperature than 60° F. The skin should always be thought of as an excretory organ, which serves an essential part in maintaining the normal temperature of the body; it should be kept everywhere uniformly warm; and not be covered with impervious articles of clothing. All clothes should be porous; Jæger's system of woollen clothing is good; combination garments are better than separate coverings for different parts; a child's feet and hands should never feel cold; if they do adequate preventive measures should be adopted.

**Nits in the hair** are common in the debilitated children, chiefly of the female sex; the hair should be cut until it is one inch long or short; the head must be thoroughly soaped with soft-soap and cleaned; it should be combed with a tooth-comb twice a day, dipping the comb into a basin of spirits of turpentine; methylated spirit also dissolves the nits off the hair; cod-liver oil, iron wine and quinine should be given, and fresh air, good food and cleanliness of body supplied.

Pediculi must be treated on the same lines. All the linen and clothing should be baked in a disinfecting chamber.

**Strophulus,** or **red gum,** is a minute papular rash, very common in infants, as the result of local irritation from flannels, sweat, and as the result of faulty digestion and feed-

ing. So-called strophulus albidus is believed to be due to distension of the sebaceous glands ; such milia may be found not only on the face of new-born, but around areas occupied by chronic eczema and other chronic skin diseases. Attention to the infant's dietary in accordance with rules laid down elsewhere, and the employment of a little rhubarb and soda mixture, with the local application of calamine lotion, and the removal of all sources of irritation, constitutes the treatment.

**Psoriasis guttata** occurs in children; the amount of silvery scales is often slight on the little red raised spots which are scattered about the trunks and limbs, chiefly on the extensor surfaces, but not thickly anywhere ; it is not nearly so obstinate a disease as psoriasis in the adult. Careful attention to the personal hygiene, and to that of the environment, good food, cod-liver oil, and iron, are important measures. Arsenic is useful, but not so useful as when the epithelial scales are very abundant. Quinine may be given with the iron. I always try the chrysophanic acid, gr. x. to ʒi. of geoline or lard locally, warning the mothers that dusky redness may spread away from the site of its application. It is advisable to apply it first only to a few spots. A mild mercurial ointment—white precipitate gr. x. to ʒi. lard or geoline ; or nitrate of mercury gr. xx., oxide of zinc ʒi., lard ʒi.—may be used.

Other, more obstinate, forms of psoriasis, with much hyperæmia, do occasionally occur in children, and require alkaline baths, inunction of simple oil, and when the redness has subsided a tarry ointment—Tar ʒi., camphor gr. x., lard ʒi. Traumaticine (purified gutta-percha one part, dissolved in ten parts of chloroform) forms a softer and thinner film than gelatine or collodion (Malcolm Morris), causing neither tension nor pain. Auspitz treats psoriasis with a ten-per-cent. solution of chrysarobin in traumaticine. The scales

are first removed by soap and water, and the solution then painted on the affected parts with a thin, short-cut pencil brush. Universal psoriasis in a child eight years old was treated successfully by Dr. Fox, of New York, with a two-per-cent. solution of salicylic acid in castor oil. Dermatine made of copal dissolved in turpentine is a valuable varnish.

**Pityriasis rubra** occurs in children; the whole body is very red and coated with foliaceous patches of whitish epithelium, the scalp desquamates. The desquamation should be aided by alkaline baths, ℥ii. bicarbonate of soda to two gallons of warm water; then the surface should be anointed with neat's-foot or olive oil. The diet must be regulated. The patient should be kept in bed at first. Cod-liver oil should be prescribed, and quinine in grain doses with 20 drops of glycerine. I think it highly useful to get the child to drink as much barley water or other bland fluid as possible. Tincture of perchloride of iron may be prescribed when the hyperæmia has subsided and convalescence is approaching.

**Herpes zoster** is not an uncommon affection in children. I have noticed it seven times in children who had hooping cough. I have seen it along the supra-orbital nerve area even in the hairy scalp in a girl aged seven. It sometimes occurs in many patches: in one case the left lower quadrant of the thorax, the right buttock, the back of the right thigh. It does not give rise to pain, and is not usually followed by the severe pain which characterises the affection in the adult. Great care should be taken that the vesicles are not irritated, as troublesome progressive ulceration may occur; scratching must be strictly prevented; I prefer simply to cover the part up with salicylic wool; no washing of the part should be done; a little powdered starch or oxide of zinc may be sprinkled over the vesiculate areas. Some use cold emollient lotions, such as mucilage, barley water, with which to bathe the parts. It is advisable to give a little

quinine in gr. i. doses, with glycerine t.d.s., or in granules, for a child six years old.

The general health requires attention; the regimen must be regulated to suit the digestive powers; as a rule nothing else is necessary. Constipation may be relieved by a simple laxative. A loaded tongue and sallow face, foul breath and clayey stools should be treated by a dose or two of mercury and chalk, gr. iii., with rhubarb and soda gr. v.; two or three granules containing these, or a capsule enclosing them; and a saline purge. Repeated powerful purgatives should never be employed for fear of setting up intestinal catarrh.

**Pemphigus** may occur in the acute as well as in the chronic form in children; the former attacks debilitated children, and especially those who have been reduced in vitality by the acute specific fevers. The eruption consists of bullæ or large vesicles, which at first contain translucent fluid which becomes opaque; the bulla shrinks and dries up, leaving a scab. The chronic form may continue its existence for months by continuous crops of bullæ, or it may consist of a single bulla (p. solitarius); it may commence soon after birth or after the first year of life.

The attention should be directed towards improving the hygiene of the person and of the environment; every care should be taken to put the patient in the way of obtaining those conditions essential to healthy existence. These measures alone will do a great deal to remove the acute form. For the chronic variety, as for the acute, arsenic is regarded as the remedy *par excellence*. It may be given in the vinum ferri in three-minim doses to a child five years old. Grain doses of quinine three times a day may be administered if the child have come from tropical or malarial parts. Sometimes the acute eruption causes much constitutional irritation and distress, which are best relieved by opiates (chlorodyne ♏v. for a child six years old). The preparations of opium

act as curative agents in this form. For the local sores clean aseptic lint should be used to keep the parts free from irritation; scratching or the introduction of dirt must be guarded against. In the debilitated child vast ulceration and even gangrenous changes may occur notwithstanding the adoption of every local precaution. The best lotion is one of lead, or an ointment of the same.

℞ Solution of Subacetate of Lead, ʒii.
Vaseline, ℥i.

Zinc ointment may be used instead.

**Scleroderma** occurs in children some years old; it is altogether different from the sclerema neonatorum, and resembles the scleroderma of the adult. The colour of the patches of induration is often like that of the healthy skin, not violet or bluish red as in the disease of the newly-born; it may be of a tallowy white tint; its causes and treatment are but little understood; it does not appear to be related to any diathesis or to be associated with any disease of the internal viscera. Some cases gradually disappear under no other treatment than friction of the hard patches with oil of any kind, and the administration of quinine and other tonics.

*A false variety of sclerema* of the adipose tissue not unfrequently occurs in fat infants; it is really the result of deficient warmth; the fat of these infants does not melt at the ordinary temperature of the body, and so appears harder than it should, especially when the infant's temperature is lowered at the surface of the body from any cause.

**Alopecia areata,** which is generally conceded to be a non-parasitic disease, occurs not unfrequently in boys and girls about the age of six, or the period of second dentition. The hair is lost in circular patches, which spread rapidly, and may lead to total alopecia. It is as much due to perverted trophic nervous influences as chorea is due to perverted motor arrangements. The hair, as a rule, tends to grow again after

a time. Its first reappearance is in the form of fine downy hairs, with little or no pigment. The process of reappearance is hastened by the internal administration of tonics, of cod-liver oil and iron; by attention to the personal hygiene and to that of the environment. It is well for the children to leave off schooling for a time, and to spend more of their energy by way of the muscular apparatus, rather than by the over use of the growing cerebral cortex.

Ointments of salicylic acid are good as stimulants, and as antiseptics. The corrosive sublimate ointment, gr. ii. to ʒi. lard, or a lotion containing cantharides or iodine, may be employed.

℞ Tinct. Canthar.
Aceti. Distill.
Glyc.
Spirit. Rosmarini } aa. ʒiss.
Aq. Rosæ, ʒviii.

sponged with care on to the scalp two or three times a day.

Two-minim doses of Fowler's solution, with steel wine, may be prescribed. Erasmus Wilson's lotion of

℞ Ol. Amygd. dulc. } aa. ʒi.
Liq. Ammoniæ
Spt. Rosmarini } aa. ʒiii.
Aquæ

is a good stimulant to the bald patches.

## SCABIES.

In examining the skin of infants always think of syphilis and scabies. If the eruption be in the palms of the hand, or soles of the feet these are almost the only causes. In the dirty and neglected, or in the scrofulous, the itch may cause severe lesions of pustular kind. In the well-tended skin of healthy children only erythema, urticaria or vesicles

may be excited by the insect. In infants the itch occurs mostly about the buttocks and feet. There is much pruritus, which is worse at night or when the parts are kept warm. The tortuous furrow or cuniculus is absolutely diagnostic; this appearance is often masked by the inflammation excited by scratching. If fortunate the practitioner may turn the insect out of its burrow with the point of a needle. The treatment consists in the destruction of the itch insect by means of some parasiticide.

The practitioner should advise the whole of the outer garments of the child to be baked in the disinfecting chamber; the under-linen may be boiled.

The best way to attack the insect in the skin is to use the hot bath, in which the patient should be kept for twenty minutes at least. The object of this is to soften and remove the cuticle, especially where it has been furrowed by the insect or raised into vesicles by the irritant effect of the parasite. Soft soap may be used to the skin, or better, Wright's coal tar soap. This soaping and hot water must be well done; the object is to lay bare the whole of the furrows; probably the procedure in itself dislodges the acarus scabiei. Dry the infant all over thoroughly, then proceed to rub in the sulphur ointment—℥i. of precipitated sulphur to ℥ii. of lard. Oil of sulphur is very good—℥iiss. of the precipitated sulphur to ℥i. of olive oil. The procedure is not a mere laying the ointment on; it is a matter of infriction and inunction, and must be done most thoroughly. There should be no need for a repetition of this treatment.

Another ointment that may be used is sublimed sulphur, ℥ss.; ammoniated mercury, gr. v.; creasote, ♏iv.; olive oil, ℥ii.; fresh lard, ℥i. In chronic cases I mostly use now the balsam of Peru, ℥i. or ℥ii. to ℥i. of vaseline or geoline. Should there be scabs and pustules, the crusts and matter must be carefully removed by sweet oil or carbolic oil; when the raw

surface is exposed the ointment should be applied to it, spread fairly thickly on clean aseptic lint.

In young children the caution not to overdo the sulphur inunctions is very necessary, for a crop of cutaneous lesions is sometimes caused by excess of zeal. The Peruvian ointment has not this objection. Storax ointment (liquid storax ℥ss., lard ℥i.) is preferred by some for obstinate cases. Iodide of potassium ointment is sometimes efficacious. If there be much heat and tenderness soothing lotions may be used thus :—Calamine powder, ℥i. ; oxide of zinc, ℥i. ; glycerine, ℥ss. ; rose water, ℥x.

## RINGWORM.

Tinea tonsurans is most contagious ; every care should be taken to keep children from mixing together or using one another's caps and other garments; neither the bed-linen, the towels, combs, brushes, nor other articles of toilette should be used in common. It is one of the commonest diseases of the children's scalp. In typical cases the circular patches on which broken, brittle, twisted, dull, lustreless hairs are seated are sufficiently diagnostic. The microscope should always be used; the conidia or refracting groups of spores may be readily discovered if a diseased hair be soaked in liquor potassæ or glycerine. The typical appearances are often masked by the production of vesicles or pustules and consequent scabbing. This is prone to occur in the poor and in the neglected, as the result of local irritation and want of good food and air ; the same may happen in the scrofulous, even when well tended, owing to their feebler vitality. Tinea circinata is the effect of the same parasite when working on the non-hairy parts. The earliest indications of the action of the trichophyton on the scalp is a circular patch with scales, and the hairs thereon are brittle and somewhat dull-looking. The brothers and sisters may have their hairy

scalp smeared with a protective ointment of dilute white precipitate of mercury.

A parasiticide is the essential feature in the **treatment**; certain precautions must be observed. There is nothing like radical measures. In bad cases insist on perfectly smooth shaving of the entire scalp if this is possible; the child should wear a linen or silk skull cap, which may be burnt from time to time and replaced by a new one. The scalp must be washed most thoroughly with soft soap and hot water, well rubbed in, a soft nail brush being most useful; and either may be used to remove all scurf and grease. When all the scalp has thus been rendered perfectly clean, if not aseptic, then is the time for the parasiticide preparation. Care should be taken in the cleansing of the scalp to clean the diseased parts separately and by itself. The disease with its spores penetrates to the root follicles; doubtless this is the reason of its difficult cure. But some scalps are uncommonly good soils for the tinea; to alter the constitution of the skin whether by parasiticide or other treatment is scientific. If the case be not severe and not chronic I use the ointment of salicylic acid ʒi. to ℥i. of geoline or vaseline; it must be rubbed in with a piece of lint and a good will, so as to penetrate to the roots of the hairs and of the disease; tincture or liniment of iodine may be painted thoroughly into and on the diseased patch or patches. Chrysophanic ointment, gr. x. to ʒi., is good, but liable to be followed by a wide-spread dusky hyperæmia; if used, warning of the possibility of such an occurrence, which is often very unsightly, should be given.

Though I have advised the whole scalp to be shaved, some parents object to this wholesome measure. If there be only one patch, and this recent, the parent may overrule the doctor's directions. The hair must be clipped perfectly close to the scalp, and for some distance around the patch. There

is less risk in this partial treatment if the child be healthy. If he be much debilitated or scrofulous the chances that the parasite will spread are very great.

The necessity for careful hygiene of the patient's person and environment with a view to promoting his general health cannot be too strongly urged. Cod-liver oil and iron or other tonics are advisable, as well as fresh air, good nourishing food and change of climate.

An application of blistering fluid may cure a recent case; or this followed by an ointment of perchloride of mercury, gr. x. to ʒi. of elderflower ointment (Ung. Sambuci); or carbolic acid ʒi., glycerine ʒss.

In the chronic cases Tilbury and Colcott Fox recommend the whole head to be soaked in sulphurous acid lotion (saturated solution 1 part, water 3 parts), in order to get rid of the disease on the surface. Epilation should be practised with a pair of special forceps, wherever possible; this is impossible if the hairs be much diseased. Coster's paste, consisting of ʒii. of iodine and ʒi. of the colourless oil of tar, may be painted on with a camel's-hair brush, cautiously, for seven or eight times at intervals of three days. The application will form a cake; this may be soaked off with a poultice well larded on its under surface so as to soften the crusts; the cake should be entirely removed before the application is repeated. In the removal of the cake a number of hairs may be brought away, so taking the place of epilation. It is useless to apply Coster's paste to the surface whilst the incrustation is on the scalp; the applications should be continued till the hairs begin to sprout naturally, when some milder parasiticide may be used.

In severe cases epilation must be carried out repeatedly. The production of artificial kerion, by the use of strong irritants, is a valuable method of treatment. I have frequently used croton oil, painting a little on every day for two or three

days until the diseased patch—only one should be done at the time—has become a veritable soft boggy "kerion." The part may be dressed with simple water dressings or bread poultices; care must be taken to prevent the croton oil from overflowing; it rarely happens that any marked alopecia follows this treatment, though some time may elapse before the hair commences to show. Beware of using strong measures in the strumous, or in those whose lymphatic glands are very easily caused to enlarge; many glands may swell up in the various parts of the neck; in one case a fatal subacute lymphadenosis followed, which may have been a coincidence.

In infants and young children these strong applications must not be used. Ringworm is usually easily cured in infants by the Ung. Salicyl. The most obstinate cases are those in scrofulous boys and girls with feeble circulations about seven years of age. One case was cured after seven years' duration by the supervention of puberty.

In many cases a change of parasiticides is an efficacious local method of treatment:—

White precipitate ointment diluted once with lard; unguentum sulphuris; these may be rubbed in with lint. Or the glycerine of carbolic acid 2 parts, and glycerine 1 part, may be painted on with a hard camel's-hair brush. The oleate of mercury ointment, 5 per cent., may be rubbed in with a sponge; great care should be taken to prevent the application from running down the face or neck; the mop must not be saturated; every care must be exercised to see that during the night-time the preparations do not trickle down from the scalp on to the sensitive skin. The children should wear a well-fitting skull-cap on all occasions, night and day. Should the scalp become sore and tender and inflamed, Alder Smith advises that all treatment should be suspended with the exception of anointing the surface with carbolic ointment, and applying over this bread and water poultices. A cure often follows this method of treatment.

Dr. Alexander, U.S.A., has treated an obstinate school epidemic—after epilation, corrosive sublimate, sulphur, isolation, and hygienic arrange-

ments had failed—by the following method:—After shaving, washing, and epilation, the patches were painted with a solution of chrysarobin 10 per cent. in liquor gutta-percha; the principles of treatment were isolation of patches of skin, exclusion of oxygen from the fungus and the parasiticide effect of the chrysophan. Seven grains of chrysophanic acid dissolved in ʒi. of chloroform is the most efficient application that Alder Smith had used (Nov. 1, 1884).

Shaving the patches, washing the head with warm water, then rubbing in oil of turpentine till it "nips," next washing with ten per cent. carbolic soap, and finally painting with tincture of iodine, is the method of Dr. J. Foulis. Dr. Payne has employed eucalyptol, ʒi., paraffin ʒii., vaseline ʒii. for early cases. Dr. Harrison uses two solutions: (1) An ounce of liquor potassæ, containing three grains of iodide of potassium; (2) an ounce of nitrous spirits of ether, containing three grains of corrosive sublimate. The hair is cut short; No. 1 is applied for a few minutes to the affected parts, and then No. 2. Mr. Malcolm Morris has diluted the liquor potassæ, because it caused kerion. In uncomplicated ringworm no doubt the ten-per-cent. alcoholic solution of salicylic acid is most valuable. A five-per-cent. solution of oleate of copper is good.

**Tinea circinata** occurs in circular red, scaly, itchy patches, on any part of the surface of the body; it spreads at the circumference and fades away at the centre. The parasite should be searched for in the raised epidermis at the periphery of the circular patch. There is no difficulty about the treatment of the ringworm; it is scarcely necessary to clean the surface, though that makes assurance doubly sure; the ointment of salicylic acid may be applied, or better, the strong tincture of iodine; one application is usually sufficient. An ointment of five grains of white precipitate with ten grains of pure carbolic acid in an ounce of geoline or vaseline; or the red oxide with the ammoniated mercury, of each ten grains in an ounce of lard or vaseline; the disease is contagious, and may spread on the same individual or be taken by another person. A warm temperature promotes its growth; some of the most luxuriant growths are found on the genital regions in warm climates.

**Chloasma, or tinea, or pityriasis versicolor** occurs as brownish or fawn-coloured circular areas on parts of the skin covered by flannel; the spots are raised, itchy and scurfy. The conidia under the microscope are seen to be larger than those of the trichophyton, and the wavy mycelial threads are more evident. The flannels should be discontinued unless they are needed to protect the chest; the longcloth mixture of silk and cotton makes a good underclothing; the regular application for many days of a solution of corrosive sublimate and glycerine, or sulphurous acid lotion, or hyposulphite of soda lotion, will effect a cure.

℞ Sol. Hyd. Bichlor., ʒss.
Glyc., ʒss.
Aq., ʒiv.

℞ Sodæ Hyposulph., ʒss.
Glyc., ʒss.
Aq., ʒvi.

The grease should be first removed from the skin by soft-soap and water, and turpentine if necessary, care being taken not to set up too much irritation in the skin. The great point is to give the applications some chance of doing their work by removing all the matter which prevents them from coming into direct and thorough contact with the disease fungus.

**Tinea favosa** is a disease of rare occurrence south of the Tyne; it affects the hairy scalp; is due to the growth of the achorion Schönleinii; its characteristic manifestations consist of sulphur-yellow cup-shaped crusts, in which the hairs are imbedded.

The treatment consists in removing these crusts by means of abundant soaking with lard or oil and linseed meal poultices. Epilation should also be practised with a pair of special forceps. Any hair that is left must be clipped away altogether

if the scalp is much affected, as is usually the case. When the surface of the scalp is perfectly cleaned, which may necessitate the use of antiseptic lotions of corrosive sublimate, or sulphurous acid, then is the time to make the special parasiticide applications. The carbolic acid and glycerine, or the salicylic acid preparations, as recommended under Tinea Tonsurans, may be employed, or the five-per-cent. solution of the oleate of mercury, care being taken to prevent the irritant from coming in contact with the skin of the face. Many of the favus children are greatly debilitated as the result of want of fresh air, food and light, and cleanliness. The removal of defects of hygiene and the administration of tonic remedies, of the iron, arsenic and cod-liver oil sort, will do much to remove the disease and prevent its recurrence.

## MOLLUSCUM CONTAGIOSUM.

The sessile hemispherical umbilicated little tumours occur somewhat frequently on the face of children and occasionally in other thin-skinned parts of the body. If their contents be squeezed out the first stuff which comes appears to be whitish sebum ; this is followed by a pale, translucent, slightly pink, lobulated mass of granulations, which under the microscope may be seen to consist of round cells in a state of incipient fatty alteration. The tumours generally bleed rather freely when thus their contents are expressed by pressure between the two thumb nails. This, though rather a painful procedure, is the best treatment. The cuticle over the tumour may be first snicked with the lancet. If the tumours be large, it is recommended to touch the interior, after expression, with the solid point of nitrate of silver. In little children, to save the mother's feelings, chloroform may be used as an anæsthetic. Small tumours may shrivel up after being touched with a little of the acid nitrate of mercury or nitric acid on a piece of match-wood, brought to a point.

Successive crops of tumours often prove obstinate, and unless systematically attacked may disfigure the face for weeks and even months together; they are contagious, and sometimes occur in epidemics.

## ECTHYMATA.

More or less tender isolated pustules with hard, inflamed bases are very common in children about the face and limbs; the crusts which form on them are thick and dark.

The treatment of these pustules is very simple; in the first place they only occur when the general health is lowered; they are very prone to occur when actual cachexia is present, but may be also seen in children whose health is temporarily deranged.

Doubtless a local irritation, even a scratch, is the exciting cause of them, an irritation which in a healthy child would leave no mark behind it; sometimes scabies or pediculi cause them. The chief treatment consists in attention to the air, food and exercise. Cleanliness is a great matter; scabies or pediculi must be treated first; the bowels must be regulated; cod-liver oil should be given, and iron wine if there be anæmia. Some authors say that quinine is a specific for these pustules. The scabs should be removed by soaking with oil, and a poultice if necessary; they may then be picked off with a clean aseptic pair of dressing forceps; when the raw surface of the sore has been cleaned with carbolic oil 1 in 40, an ointment composed of carbonate of lead gr. iv., glycerine ʒi., and vaseline ℥i., may be applied, and kept so by being spread on a piece of lint; the red oxide of mercury (gr. x. to ℥i. geoline) ointment or the dilute white precipitate may be used instead.

## ERYTHEMATA.

Erythemata, for the most part non-contagious, own a legion of percentage causes—cold, heat, friction, scratching, flannels,

parasites; fevers, catarrhs and sore-throats; digestive disturbances, dentition and rheumatism. The most important erythemata indicate the presence of rheumatism; their fugacious nature is very marked. Intertrigo is not considered here, but as an eczema. The removal of all local causes of irritation is the first essential in the **treatment** of erythemata; personal hygiene, as elsewhere defined, must be prescribed; the bowels should specially be kept free by simple means. Frequently tonics (quinine, cod-liver oil, and iron) are needed, for though the irritant be the exciting cause, yet it might be insufficient to cause an erythema in a healthy child. *Idiosyncrasy* should be remembered; the state of nervous vasomotor apparatus is chiefly responsible for many erythemata. The itching may be relieved by such soothing agents as:—Zinc ointment; lead lotion, ʒi. to vaseline ℥i.; zinc oxide, ʒii., glycerine, ʒii., and lime water, ℥iii.; calamine powder and oxide of zinc, half an ounce of each with ℥ss. of glycerine and eight ounces of rose water; nitrate of silver, gr. ii. to ℥i.; alum, gr. x., glycerine, ʒi.; rose water, ℥ii. The erythemata of rheumatism hardly need any local treatment; as a prophylactic the patient should be confined to bed.

### ERYTHEMA NODOSUM.

Erythema nodosum is allied to rheumatism, but seldom occurs in association with heart disease or true rheumatic arthritis. The blood vessels are not merely dilated, some extravasation at least of red colouring matter occurs; that rheumatism can burst the blood vessels is good doctrine. The large bumps with bluish borders come out in successive crops on the front of the shins and thighs, backs of the forearms and arms. Their eruption is often preceded by rather severe pains and lassitude; occasionally the knee joint swells. There is usually slight fever and indisposition. The bumps tend to recur in the same patient. Their situa-

tion, and size, and number, and their disappearance as of fading bruises, are sufficiently diagnostic. It is very rare under five years of age. How to avoid the relapses of this complaint is not known. The stools may be infrequent or unhealthy. The bowels should be freely opened at the onset of an attack by saline purgatives. Eno's fruit salts ʒiii., or sulphate of soda ʒss. and magnesia ʒss., with infusion of senna ℥i., may be given hot before a meal to a child five years old. The bowels should be kept gently relaxed all through the two or three weeks' illness. It is advisable to keep the patient abed, or at least confined to a couch in one room, the ventilation of which should be as perfect as possible.

*Local applications.*—It is well to wrap the legs up in cotton wadding, and hot spongiopiline may be applied and repeated every hour if the pains are bad. Cold compresses are preferred by some. Lead water and laudanum may be used to wet the compresses. The *dietary* should be light but nourishing during the illness, not much meat or eggs, no potatoes or sweets. A little wine may be required for the debility or feeble digestion. Quinine sulphate may be prescribed in grain doses three times a day; it may be swallowed in pillules or mixed with glycerine. Dr. Eustace Smith recommends dram doses of oil of turpentine for chronic cases; it can be but seldom required; some authorities recommend calamine lotion or bicarbonate of soda 3i., glycerine 3ii., rose water ℥iv., to be applied hot to the bumps if painful. A few minims of fluid extract of cinchona in syrup of orange may replace the quinine; iron may be given for the anæmia.

## URTICARIA.

Factitious urticaria and spontaneous non-contagious urticaria are very common, especially in the neurotic, and have the usual number of causes. The little white bumps are very distressing to the patients; the wheals are not so distinct in children. The chronic form of urticaria, *lichen urticatus*, may persist for months as a faulty habit of the skin and nerves, in spite of much careful treatment; urticaria is some-

times of rheumatic source. *Acute urticaria* occurs in the child as the result of indiscretions in diet similar to those in adults—shell fish, mushrooms, potted meats or sweetmeats; frequently the onset is pyrexial and attended with vomiting and prostration. Excessive clothing and great heat may cause it. Scabies and more superficial parasites may be causes of urticaria in the child, if the skin is well looked after and not very delicate. As a rule in the poor and neglected, these parasites cause a greater degree of inflammation.

The removal of all local sources of irritation, abatement of *gastric* symptoms, opening the bowels by simple means, keeping the child in bed on a milk diet for a few days, is the best mode of combating the acute form.

Any emetic is useful if the spontaneous vomiting has not left the child free from discomforting nausea. The *bowels* may be kept regular by the rhubarb and soda mixture, or a few doses of infusion of senna; or if there be signs of hepatic disorder, by a dose of mercury and chalk with rhubarb. A hot alkaline bath, ʒiii. bicarbonate of soda to two gallons of water, is excellent to relieve the itching and bring out the eruption; bran liquor may be added to this bath. The itching may be relieved by many applications:—Carbolic acid solution 1 in 100; Liq. Carbo. Deterg. ʒi. to ʒiii.; cyanide of potassium ʒi. to ℥xx. All these are best applied warm in the acute eruption; they should be kept constantly on the eruption, if the itching is bad, by means of clean aseptic rags; occasional dabs with the lotions to particular parts may be alone necessary. Some prefer dry dusting powders; exclusion of the atmosphere is the apparent aim. In *lichen urticatus* the excretory organs, bowels, kidneys, and sweat glands must be kept working; the blood must not be surcharged by excess of food.

All *foods* should be given in strict moderation, and rigidly

regulated, but there is no special food which need be interdicted altogether. Milk, meat, second-day's bread, one potato, and a little cauliflower, are suitable for a child two years old; some mothers notice that meat or milk make the eruption worse or more itching. The drug which I recommend is *liq. arsenici hydroch.*, in ♏i. doses t.d.s., after the bowels have been got regular with Mist. Rhei c. Soda, or fluid magnesia, for a few days. The itching may usually be allayed by Lot. Carbo. Deterg. ʒi. to ℥ii. or more water, as may be required.

Dr. Eustace Smith strongly advocates *quinine* in full doses. I have tried this in a few cases, and it certainly answered admirably, but not better than the arsenic treatment. I am not in favour of large doses of quinine in children for any disease. It may be erroneous, but I think I have seen chronic deafness result therefrom, and sometimes the nervous system has seemed to me to be much perturbed for months afterwards. Many of the cases of lichen urticatus, indeed, are cured straightway by regulating the food and drink and by the use of the Mist. Rhei. c. Soda, or other antacid and laxative.

To be well grounded in the belief that the nerves are the dictators of this lichen is good in treatment: prescribe nervine tonics like arsenic, quinine and strychnia.

Meigs and Pepper advocate nothing but mild laxatives, saline or mercurial, and antacids such as magnesia and lime-water, if the stomach be sour. I am sure that this treatment is very good, but it will not cure more than half the cases; some nervine tonic will be necessary.

*To relieve irritation.*—Simple dusting with flour or toasted rye; salt and water when the skin is not excoriated. Sulphuret of potassium baths, ℥ii. to 2 gallons, are recommended for chronic urticaria; also calamine lotions. Carbonate of ammonia and acetate of lead, of each a dram, dissolved in ten ounces of rose water, may be used in acute urticaria. It is seldom necessary to resort to other soothing applications than the tarry one mentioned above. Storax ointment (storax ℥i., lard ℥ii.) is lauded by some, sulphur by others. These are most serviceable when parasites have been at work. But I prefer balsam of Peru ♏ii. to ℥i. of

vaseline. Calomel 3i., belladonna ext. 3i., lard ℥iv., may be used to allay itching.

## ROSEOLA INFANTILIS.

This sometimes occurs apart from rheumatism, smallpox or vaccination, when it is usually set down to chill or slight gastric derangement. The rash may look like measles, but it is not so dark-coloured, is not usually crescentic in arrangement nor accompanied by catarrhal symptoms. It is usually patchy in distribution, but may be universal; is prone to recur in the same child, often in autumn or summer; and departs of its own accord. The malady may be treated with Mist. Rhei c. Soda ʒii. to a child three years old, to which sulphate of magnesia gr. x. may be added. In addition a dose of seidlitz powder or Eno's fruit salts may be needed. The itching may be relieved by cold cream or vinolia. The diet should consist of broths, milk and water whilst the rash lasts. An antacid of fluid magnesia or soda and a purgative may be ordered to abate acidity and lessen gastric and enteric catarrh. The child, if young, had better be put to bed in a properly ventilated room till all rash and intestinal catarrh have subsided. Outdoor exercise and attention to the dietary may be ordered on general principles after the child has recovered; the skin must be kept so clad as to be protected from chills due to sudden variations in the weather.

## CHILBLAINS.

Dr. Dawson Williams points out that the first or erythematous stage is most amenable to treatment. Counter-irritants as a rule are useless, but iodine, acting as an astringent, may cause pressure on the deeper layers of the cutis. Collodion is valueless, for the skin cracks with its cracking. Cotton wool carefully packed is very useful; calamine lotion allays itching; cold and wet should be avoided; dry cold is less harmful; washing in very hot water is prophylactic;

woollen stockings and armlets should be worn; dry boots are necessary; tonics improve the general health; phosphate of iron is recommended, not cod-liver oil; high feeding must be avoided. Bathing in pumiline baths and the use of pumiline ointment (Stern's) are very useful in all cases of defective circulation, but especially for that polarised defect of circulation—chilblains.

## ECZEMA.

Eczema simplex, eczema rubrum, and eczema impetiginodes occur in childhood with great frequency. It is useful also to speak of a local variety—eczema capitis, and of a more or less widespread eczema infantile.

*Eczema simplex* occurs in various parts of the body; it is frequent behind the ears, on the cheeks, and about the nostrils. Its first stage of a red background with a crowd of vesicles is not often seen. What mostly greets the eye is a red moist surface more or less covered with crusts of yellow, brownish or blackish colour, according to the serous, seropurulent, or purulent character of the discharges.

*Eczema rubrum* is simply a greater degree of catarrhal inflammation of the skin, with corresponding increase in the local appearances; it is attended with constitutional disturbance, which is partly due to the inflammation itself; the inflammation is partly dependent on the constitutional state. Its chief seats are the thin-skinned parts about the elbow, knees, axillæ; it occurs also about the head and small of the back. The term *eczema pustulosum* is applied when there is a purulent discharge. Scrofula which makes chronic lesions tends to make them suppurative. The diagnosis of the bulk of eczematous cases is not difficult. *Intertrigo* is known by its seat; when the secretion is removed the papillary layer of the skin is seen not to be hypertrophied, its discharge does not thicken linen. *Scabies* may cause an eczema. *Erysipelas* with scabs is known by the acute constitutional disturbance,

the brawny infiltration and sharply outlined advancing scarlet margin. The first day of an eczema about the face may be mistaken for measles; the absence of high fever and coryza is a sufficient distinction if the practitioner does not care to wait a day or two before expressing an opinion. Although eczema usually attacks the thin flexor surfaces, it may also occur where the skin is thick; then its vesicular character is often masked, a mere papular slightly scaly eruption appearing. Eczema passes through the stages of hyperæmia, papulation, vesiculation, and sometimes pustulation; it is valuable to remember these transitions. *Psoriasis* is a slower eruption, with more desquamation and less effusion; its chief seats are the backs of the limbs, where the skin is tougher.

The **treatment of eczema** consists in the complete and perfect removal of every conceivable kind of irritation; and in treating the constitutional condition. The hands must be muffled, if necessary, to prevent scratching, which not only acts as a direct irritant but frequently introduces also the further irritant of dirt. Soaps should not be used to the sore places. I always interdict the use of water, believing that sweet oil is a far better agent for cleansing the sore; it may be employed with a piece of antiseptic cotton wool. The rubbing of clothes against the sore places should be prevented and anything which causes pressure should be removed. The grand principle of local treatment is the removal of every possible source of irritation. The atmosphere of towns and cities, and most places at the level of the sea, swarms with mechanical, chemical, and bacterial impurities; the atmosphere must be rigidly excluded, unless the patient be in a perfectly pure atmosphere, such as usually obtains at mountain stations. The sea coast will seldom do for eczema; the air is too salty and irritating. Disorders of the blood-vessels, nerves and lymphatics distributed to eczematous surfaces may prove sources of local irritation. These will be recon-

sidered further on. Lastly, the tissues of the skin itself may have had a lasting share in the causation; this defective health of the cutaneous protoplasm is the least remediable. Forget not that a period did exist in the child's career in which there was no eruption; this should prove an encouragement to the practitioner in some of those obstinate cases of infantile eczema which continue throughout the whole period of childhood.

Before *topical applications* are made the crusts or scabs must be removed. The ointments or lotions are valueless if applied over the crusts. If the encrustations be thin, and not abundant, they may be best removed by soaking with sweet oil or lard; time is required to soften the crusts before they can be cleaned away with oiled antiseptic wool or lint. If the crusts be thicker, lie over a thin bed of purulent secretion, sweet oil or lard may be allowed to soak into them, and a good linseed meal poultice, well oiled or larded, covered with impervious oil silk and cotton wool, should be applied for a night or four hours. The next morning there will be no difficulty in clearing away the encrustations. Repeated poultices may be required. The removal is best effected by means of a clean pair of dressing forceps; before the applications are made, a clean, raw surface should be exposed to view.

For most weeping raw surfaces of this kind I use the following soothing astringent ointment or the Ung. Glyc. Plumbi Subacet. dil. :—

℞ Litharge, 3 parts.
Olive Oil, 4 parts.
Lard, 2 parts.
Yellow Wax, 1 part.
Eucalyptol, 1 part.

For those parts of the skin that are not moist, but dry, and red, and itchy, my favourite prescription is —

℞ Lotio. Carbon. Deterg., ʒi.
Aq., ℥ii.

The ointment should be kept constantly applied by being spread on lint. If the face is affected in some degree, a mask of lint, on which the ointment is spread, may be used, apertures being cut for the eyes, nose and mouth. Crusts and scabs must be removed as often as they form. The lotion should be applied by means of clean aseptic rags, and these are to be kept constantly wet with it; or if they are ill-borne, sponging or washing with the lotion for a quarter of an hour at a time may be practised. Another good soothing lotion for moist eczema is composed of a dram of oxide of zinc and a dram of liquor plumbi subacetatis rubbed up in an ounce of neutral geoline or vaseline.

Local applications are important, but *constitutional therapeutics* are of greater importance. Sometimes careful inspection and inquiry reveals no constitutional taint whatever. A gouty history may be overlooked.

*Elimination of internal irritation.*—A gouty disposition is an important cause of some cases of infantile eczema. If the child be healthy, whether there be a gouty or asthmatic family history or not, I usually prescribe the mixture of rhubarb and soda three times a day (ʒi. for a child six months old) for a week or so. This keeps the bowels regular, perhaps acts also on the liver, increasing its excretory functions. By such means we may believe that the blood is kept in a purer state, less liable to irritate the eczema.

*Restoration of health of skin by alteratives.*—In cases of the kind under consideration, after the disease has become chronic, use liq. potassæ arsenitis in two-drop doses four times a day, immediately after the meals. It may be combined with iron wine or ferri tartarati gr. ii., Syr. of Tolu ♏x. and Aq. Carui ʒii. It rarely causes any irritation of the stomach; should it do so, smaller doses may be given, or it

may be suspended, and the treatment for gastric catarrh substituted. Generally it seems to improve the condition, and the eczema sensibly abates; it may be continued for weeks or months. Asthenia and anæmia may be very considerable percentage causes; forget not quinine, strychnia, cod-liver oil and iron.

*Syrup of iodide of iron* may be prescribed, should there be scrofulous signs, instead of the oil; but I prefer the latter. The iodide may be given in three to five-drop doses in water or syrup or decoc. sarsaparilla.

*Mercury* as a rule should not be used, but small doses of Hyd. c Cret. or calomel may be given when the stools are pale or clay-coloured, and as an experimental alterative in obstinate cases.

It will be highly necessary to attend to the state of the digestion and bowels. In all cases the dietary should be specified. The first principles are to see that the albumins, fats and starches are digested by inspecting the stools and watching the increase in weight of the child. In the *early stages* of eczema the dietary should not usually contain sweets, fruits, fat, much meat, or much starchy foods. The diet must be unstimulating; should the complaint occur in children above the age of 18 months, meat and potatoes should be left off for a few days; the food should consist chiefly of fluids. Experiments in dietetics are certainly well worth a trial; individual peculiarities may override ordinary dietetic rules.

Any sourness of breath or acidity should be treated by antacids—magnesia or soda. When the disease is chronic all kinds of foods may be allowed in moderation. I am sure, from personal observation, that a moderate allowance of fat does not always increase the eczema nor render it more chronic. Sweet stuff from the shops is not good for any children; interdict its use in eczema or any other disease;

the case is not the same with fruit compôt home-made jam, or clear good honey; though the amount of sugar the latter contains should make us cautious of allowing them in too large quantities. Fresh stewed fruit indeed has at times seemed to effect an improvement in the eczema, there can be little question that the bowels sometimes act better when it is taken regularly. Sudden changes in the diet are frequently attended by alterations in the eczema, sometimes for the worse, and conversely. Tea and coffee frequently make eczema worse; do not allow them to many children; the children may be made to believe they are taking tea or coffee by a little device of the nursery.

When the eczema is acute the distress may be considerable, greatly interfering with the child's sleep and making him peevish and restless during the day. Under these circumstances the bowels should be unloaded by a large rhubarb and soda powder, or some sweetened castor oil. The red and hot areas of skin may be soothed by simple water dressings or emollients, as cold barley-water or cold bran-water; the barley-water made as elsewhere described, the bran-water by pouring boiling water on bran placed in a sieve, then waiting till the filtered water has cooled. The bowels should be kept gently acting by infusion of senna and sulphate of magnesia or fluid magnesia. Diarrhœa may require treatment (see p. 54).

The hygiene of the environment and personal hygiene are fully as necessary for eczema as for other diseases; beyond what has been indicated nothing special is required.

*Other Local applications.*—Mild stationary eczema has been treated by dilute nitrate of mercury ointment, weak tar ointment, or zinc ointment made with benzoated lard; these are very suitable.

In the acute forms cold-water dressings, cold emollient lotions of barley water, marsh mallow, linseed or bread and water poultices, have been and are used. Whatever is used must be kept constantly applied day and night; the sore surface must be protected by aseptic lint.

Lassar recommends this paste in chronic eczema in children :—

℞ Salicyl. Acid, gr. xv.
Zinc Oxide } aa. ʒvi.
Starch }
Vaseline, ℥iss.

It does not dry, and sticks well to the sore parts.

Oleate of zinc is recommended in acute eczema by Shoemaker; an ointment may be made of ʒi. to ℥i. of lard or geoline; the powdered oleate is useful in intertrigo; powders are less suitable than cleaning drying and oiling the parts.

*Limited chronic patches* may be treated, after cleaning the scabs off, by tar ointment or some strong lotion, as nitrate of silver two or more grains to the ounce. Various ointments and lotions of mercury are also used; they are all antiseptic, and stimulant or irritant. Care should be taken before making a second application to see that these stronger applications do not excite the eczema too much; the tarry applications are best.

**Xanthelasma** (Xanthoma multiplex) occurs rarely in childhood, and may be congenital. The lemon or chamois-leather-coloured patches occur scattered about the skin of the arms, legs, and trunk, but the eyelids mostly, not always, escape. Dr. T. Barlow has recorded ("Path. Trans." xxxv.) one case in which the eyelids were typically affected; it may be hereditary, and more than one member of a family may be affected. The general health is certainly not always good; though jaundice has not been recorded in connection with the disease, yet urticaria, indigestion, lithuria, and hæmaturia have been observed. In a few cases of simple jaundice elevated papules without any colour than that of the skin may be seen even in children, recalling xanthoma diabeticorum. Xanthelasmoidea is allied to urticaria pigmentosa; the skin gets pruriginous and pigmented; it acquires the itching and pigmenting habit; a leaping and bounding period may shake off this tendency. The treatment should be hygienic and dietetic. Warm woollen clothing and outdoor exercise to keep up the action of the skin and bowels,

are very important. The amount of nitrogenous food should be reduced if there be any sign of lithiasis, and the treatment may be carried out as directed for that derangement of health.

**Xeroderma and Ichthyosis** are generally of congenital date. Warm and emollient baths of barley water, oatmeal water, or alkalies, with the rubbing in of vaseline, olive oil, oil of sweet almonds, is the local treatment. It is important to remove the scales and patches as much as possible and to keep the skin perfectly clean. Great is the necessity for attending to the state of the bowels and urine; the diet should be regulated in accordance with the general principles formulated at the beginning of this book.

For the description of a case of "Harlequin fœtus" see a paper in the Royal Medical and Chirurgical Transactions by Mr. Bland Sutton.

In **Prurigo** there is an eruption of isolated papules of the colour of the skin; the papules occur chiefly on the extensor aspects; the itching may be very severe; whether the papule or itching comes first is not known. The treatment consists in the avoidance of unfavourable hygienic conditions, damp and ill-ventilated dwellings, improper food (salty and stale foods especially), uncleanliness of the body and its clothing. Warm baths, or better, mucilaginous baths of linseed, bran, and barley water are valuable for cleansing the skin and relieving irritation. Alkaline baths—one ounce of carbonate of potash to each gallon of water—are also useful to allay irritation. The inunction of soothing ointments or of oil of sweet almonds may be tried, or a weak lotion of liquor carbonis detergens. Sulphurous acid baths, one ounce to the gallon, has relieved obstinate cases. It is an evil habit of the nerves and cutaneous protoplasm very difficult of cure.

# CHAPTER XI.

## THE DISEASES OF THE MOUTH AND THROAT.

### SIMPLE STOMATITIS.

A FORM of simple inflammation is met with in infants, especially during the period of the first dentition. The gums and lips become swollen, and the colour of the mucous membrane of the mouth becomes dark red, livid, or more scarlet. The infant cries whenever the inflamed parts come in contact with resistance of any kind: the child cries when put to the breast or given the bottle. There constantly flows from the mouth a slimy, watery saliva; the epithelium of the gums and lips is prone to become macerated and removed, giving rise to little patches on which thrush may grow, as on any abnormal surface. The submaxillary region and its glands may participate in the inflammation, becoming swollen and tender. The lips and gums feel preternaturally hot; the temperature of the body is raised, as a rule, not above 100·5. but I have taken a temperature of 104 in the rectum in some cases when there appeared to be no further explanation than the simple stomatitis to account for the fever if exception be made of the neurotic type of constitution. In addition to its complicating the process of teething, forget not that the development of measles and scarlet fever, and other acute specific fevers, may be attended with the appearance of the same form of simple stomatitis, and that it is possible that the stomatitis may be the leading feature of the acute fever; explain thus some cases of stomatitis with high temperature. At the same time overlook not that the heat-governing apparatus of infants and the highly neurotic is easily thrown

out of gear, at least for a time. Much of the sleeplessness and irritability of infants during teething may be explained by this simple inflammation and the neurotic habit. As to the pathology doubt not that the active physiological process of eruption of the teeth must be a potent factor in the causation of the inflammation, in harmony with the well-established principle of pathology which demonstrates the frequency with which the sites of rapid growth are the seats of morbid processes generally. Sometimes the inflammation goes beyond its usual limits, or assumes another character as the result of a new cause, *e.g.*, microbe. An exudation as patches of false membrane may be seen as in the stomatitis of scarlet fever. The treatment of this simple form of stomatitis is very easy (a small dose of castor oil); nothing active need be done; the inflammation usually subsides of its own accord in the course of four or five days. Indeed, as above hinted, a still more transient degree of inflammation may occur, and be overlooked by the mother, who does not consult the doctor until the acute signs have disappeared.

The **most local treatment** which can be required is the use of a lotion of boracic acid, and chlorate of potash to syringe over the inflamed parts, the infant's head being held well forward to prevent the passage of the lotion down the throat. A dram of each salt in a pint of water makes a suitable lotion, and a dram of glycerine may be added.

### APHTHÆ.

It is a disputed point whether the so-called aphthous stomatitis is of a vesicular nature, or whether the whitish spots are not due to an exudation of the fibrinous sort. Anything which could be called a vesicle is in my experience seldom seen; the mucous membrane of the tongue is constantly being soaked by the oral secretions, so that a macerated look due to soakage of raised epithelium readily occurs; thus

may be masked the vesicular appearance as we know it in the skin. I have seen herpes facialis associated with aphthous looking ulcers in the mouth; though this is no proof that aphthæ are of a vesicular nature, it does lend some countenance to the view. All forms of stomatitis may be but different degrees of one kind of inflammation. A gradation in severity between simple stomatitis, aphthous conditions, ulcerative stomatitis, and gangrene doubtless exists; but the mere gradation is insufficient to warrant all the degrees being described together, more especially as the clinical characters differ very considerably; the clinical differences might be attributed to a greater severity of the inflammation. Different causes may originate morbid anatomy identical so far as macroscopy and microscopy at present go. The tissues can respond in but a limited number of ways.

Aphthæ are very commonly seen in infants during the period of dentition. Teething can hardly be regarded as the sole cause, any more than the bronchitis or diarrhœa which are frequently accompaniments of teething can be solely ascribed to the same physiological process. Besides, aphthæ certainly occur in the mouths of infants before the first tooth is cut, and after the last of the milk teeth has appeared. The disease may be excited by the introduction of some irritant into the mouth; a child puts everything it holds in its hands to the test of the sense of taste.

The tongue is covered with small rounded spots of whitish, greyish, or yellowish appearance, each of which is bounded by a ring of bright redness; these spots may be isolated or confluent, giving rise to various patterns. The aphthæ occur, but are less numerous, on the inside of the cheeks and lips; a few may be seen on the soft palate and other parts of the back of the throat. Constant running from the mouth, with offensive smell of the breath and secretions, are symptoms

of aphthæ, as they are symptoms of all diseases of the mouth of any consequence. A certain degree of fever accompanies the disease; the infant is usually restless and sleepless; the act of sucking, or attempts at chewing, speaking, or swallowing, are attended with discomfort and crying.

The **treatment** of aphthæ consists in attention to the diet and to the gastro-enteric canal. The food should be restricted on the principles laid down in Chapter II. It will often be found that tea, cheese, pastry, sweets, cakes, beer and a little of everything have been freely partaken. If there be vomiting or diarrhœa, a small dose of castor oil followed up by the castor oil mixture, or the bismuth one will suffice.

The mouth should be thoroughly and frequently cleansed by syringing with simple water, coloured with Condy's fluid, and after each cleansing a little borax and honey, or glycerine and borax (one dram to two ounces) should be applied to the sore parts by means of a camel's-hair brush or the finger. Attention should also be given to every hygienic circumstance.

*Chlorate of potash* lotion gr. x. to ℥i. is a useful topical application. *Bismuth trisnitrate* has been used locally. *Borax and chlorate of potash* may be combined. A weak solution of sulphate of copper may be painted on with a camel's-hair brush. Glycerine alone is an antiseptic. Dilute solutions of acids also. Iodide of potassium gr. v. to ℥i. may be used as a paint. Also sulphurous acid lotion or spray. Salicylic acid one per cent. alcoholic solution is another local application. Quinine internally in grain doses every three hours has been prescribed when diarrhœa is present. A rhubarb mixture and Hyd. c. Cret. may be used to correct indigestion and irregular action of bowels.

## THRUSH.

Thrush is an epiphenomenon, due to the growth and development of a yeast-like fungus—the oïdium albicans or mycoderma vini—on deranged or altered mucous membranes. It may occur in any part of the mucous membrane of the alimentary canal. The fungus may be identical with

that of the lactic acid fermentation of milk. Of course the mouth is the chief seat of the thrush ; it may be found in the gullet, in the stomach (posterior surface, near the lesser curvature, near the pylorus, rather than elsewhere—this is the lieu d'élection of all gastric alterations), in the intestines, chiefly the cæcum, which is again a favourite seat of disease. The mucous membrane must be disordered in order that thrush may thrive on its surface ; its reaction, like that of all healthy tissues (except the surface of the stomach), should be alkaline ; acidity is a favouring element in the growth of thrush ; a piece of blue litmus paper generally turns red when applied to a patch of thrush.

Infants with thrush are always out of health, and may be seriously so. The symptoms of heat of mouth, thirst, vomiting, diarrhœa, fever, which may be high, are set down not so much to the thrush as to the derangement of the mucous membrane. Thrush engrafted on a simple temporary catarrh of the mucous membranes is not a dangerous sign ; it has an ill omen when associated with food atrophy or marasmus from any cause.

Thrush may be mistaken for particles of *curd* arrested on the fauces, or hanging about the cheeks and tongue ; curd may be easily removed by wiping, and the surface beneath will be seen to be healthy ; when the thrush patch is removed a hyperæmic, excoriated or ulcerated surface is brought to view ; diphtheria seldom has any resemblance to thrush.

The **treatment of thrush** is almost entirely hygienic and preventive. The first and most important part of the hygienic treatment is the regulation of the food, and the institution of an inquiry into the state of the *food utensils*. As often as not the food will be found to have been given in unsuitable quantities, at irregular times and of an improper kind (see Chapter II.). The infant may have had too much boiled bread or starch, in the form of so many of the unmalted and

malted farinaceous foods. These, beyond a certain amount, being indigestible, undergo fermentation with the development of acidity. Often the bottle, teat, cup or spoon, will be found not to be clean and aseptic as they really ought to be. When the food and food vessels have been investigated, the same careful methods should be directed to the air that the child is to have; it must be free from stench, offensiveness or stuffiness, from humidity and coldness; it must be pure and warm; so it should not be passed first through the water-closet and then into the nursery; equally must it not be fouled by the presence of soiled napkins, soiled linen, stale foods, dirty toys and other articles. It must not be vitiated by being used by too many people; the nursery must have sufficient cubic space, and be properly ventilated. The water used for food purposes should be boiled or filtered, or both, and not be left uncovered in the room, for it absorbs gases and dust, bacteria and epithelia fall into it.

Diarrhœa and vomiting must be treated as recommended under simple and inflammatory diarrhœa and athrepsia. The chief indications in the thrush which attends simple and temporary derangement in an otherwise healthy infant, are to abate acidity by the use of alkaline carbonates, empty the intestines of all irritative matter, and take good care that no unsuitable matter is again introduced. Five-grain doses of bicarbonate of soda with a grain or two of rhubarb (to bring a little more bile into the intestines), and a dram of compound infusion of gentian (as a bitter and preventive of fermentation), to be taken thrice a day, is a good prescription for a baby 12 months old, provided the bowels have been opened previously by a dram of castor oil or six grains of rhubarb and soda. Do not keep the infant indoors if the weather be fine in the day-time, as it is likely to be, for thrush is rifest in July, August and September.

Last, but not least, local hygiene and asepsis. The mouth

should be syringed out with weak Condy's fluid or simple water; it may be swabbed over with a piece of wet, soft, clean rag, which should be burnt after being once used; or a piece of sponge in a sponge-holder; or a full camel's-hair brush soaked in the weak Condy's fluid. When the surface has been thoroughly cleaned in this fashion, then comes the alkaline lotion, in the form of borax gr. x., glycerine ℥xx., and water ℥i.; this should be freely used, and repeated four or five times a day—the oftener the better. Alkalinity is unfavourable to the growth of the fungus. For cases of thrush complicating athrepsia, the same treatment must be appended to the treatment of the marasmus.

More or less stomatitis with ulceration may complicate; chlorate of potash is used both externally and internally; carbonate of ammonia has been prized, and may be given in grain doses in milk, four times a day, to a child one year old.

**Prophylaxis.**—It is a good thing to rinse the mouth with warm water after each meal; a piece of clean lint, a camel's-hair brush or a mop of sponge may be used; if the latter are used they must be kept in aseptic solutions, such as ℥i. to Oss. of salicylate of sodium.

## ULCERATIVE STOMATITIS.

Aphthæ and ulcerative stomatitis are believed to correspond to the foot and mouth disease of cattle, and to be communicated by cow's milk to children. Generally the ulcerative disease occurs in childhood, as opposed to infancy, *i.e.*, after the second year. Ulcerative stomatitis is characterised by sponginess, swelling and redness of the gums which bleed easily; on the surface a greyish white or yellowish exudation appears. The fœtor of the breath, the salivation and difficulty of mastication and deglutition common to all diseases of the mouth are well marked. The

morbid process varies in extent and severity; the lips, palate and cheeks are frequently involved; it seems to spread by mere contact; the ulceration may lead to loss of teeth, to necrosis and to much bleeding. There is frequent nausea and a loaded tongue; usually the bowels are constipated, and the temperature raised to about 102°. With care and attention the disease may be cut short and all traces may disappear in a week. It sometimes lasts longer, though in a straggling fashion, the ulceration hardly spreading; in a case of microcephalus it has resisted all treatment. If this is the case, touching the ulcer with a camel's-hair brush loaded with nitrate of silver (gr. xx. to ℥i. distilled water) will generally heal the sore.

For the **local treatment** of the ordinary cases nothing surpasses the chlorate of soda or potash. The mouth should be thoroughly and as frequently as possible syringed with this lotion (gr. x. to ℥i.). Internally given the remedy undoubtedly does good, but I have cured many cases by the local application alone, and I am not sure whether the prolonged administration of the chlorates does not induce debility and anæmia. True they are not required for long in this disease. The usual dose is three grains of chlorate of soda, with twenty drops of glycerine in two drams of water for a child two years old. Hydrochloric acid dilute ♏iii. may be added, or half-a-grain of quinine. The mouth must be frequently cleansed with the lotion, and the child, if old enough, should be kept gargling for the best part of its time during the day. The lotion may be mopped on with a plug of absorbent wool. All the food had better be cold and in a liquid form. After the completion of each meal the child's mouth should be washed out with the chlorate of potash lotion.

Cases of this kind often come from mews and from other quarters of the poor which are liable to have the atmosphere

contaminated by effluvia of various kinds. The necessity for fresh air is as great in the treatment of these cases as is the necessity for proper feeding. Tea, cheese, pastry, sweets, cakes, and excesses of sugar and starch (potatoes, sago, tapioca, &c.), must be avoided. (See chapters on Hygiene and Feeding.) The food should also contain enough of the antiscorbutic element, for there is reason to believe that scurvy may manifest itself chiefly as ulcerative stomatitis. A little port wine or brandy is most valuable in the debilitated and cachectic. Very loose teeth may be extracted; if only slightly loose they may become fixed again; sometimes a tooth keeps up the ulceration. Tonics are often necessary to raise the standard of health; mineral acids and cinchona are the best. Iron in some form may be given if there is anæmia. Tonics are valueless unless the primæ viæ are acting regularly. Some combine the tonic with the chlorate. The following prescriptions are suitable for a child two years old.

℞ Dilute Nitro-Hydroch. Acid, ♏iii.
Spt. Chlorof., ♏iii.
Tinct. Aurantii, ♏v.
Water to ʒii. t.d.s.

℞ Dilute Hydrochl. Acid, ♏iii.
Syrup of Orange, ♏x.
Inf. Cinch., to ʒii. t.d.s.

℞ Compound Tincture of Cinchona, ♏xx.
Syrup of Mulberries or Glycerine, ♏xx.
Water to ʒii. t.d.s.

℞ Sulphate of Magnesia, gr. v.
Dilute Sulph. Acid, ♏ii.
Sulphate of Iron, gr. ½.
Syrup of Ginger or Tolu, ♏x.
Peppermint Water to ʒii. t.d.s.

℞ Tinct. Ferri Perchl., ♏v.
Glyc. or Syrup, ♏xx.
Potass. or Sodæ Chlor., gr. iii.
Water to ʒii. t.d.s.

*Anæsthetic.*—In any ulceration of the mouth preventing proper alimentation, painting a solution of hydrochlorate of cocaine on the ulcerated parts may be used with advantage a few minutes before the ingestion of food. I am bound to say that some children object to the taste and effect of cocaine even more than to the pain attending unassisted swallowing; these effects of cocaine are not remedied by flavouring either with lemon or rose. A restricted regimen is almost invariably indicated in ulcerative stomatitis at the outset; iced milk or beef tea can usually be swallowed without suffering, and indeed the cold gives great relief to the morbid sensations in the mouth.

Should *necrosis* occur, hot poultices frequently renewed may be applied outside the tender part; the stench must be abated by frequent local cleansings: and the surgeon may be called in. (See Cancrum Oris.)

## SIMPLE SORE THROAT.

Simple sore throat complicates catarrh (see p. 148). The great practical point is to diagnose it from scarlet fever, german measles, and measles, which is not always easy when the case is first seen. The doctor is generally sent for in a case of *markedly febrile* catarrh. A very bright red throat—punctiform and uniform like the skin rash—is suggestive of scarlet fever; if there be a very rapid pulse, and the illness began with vomiting, but little doubt should remain. Explosive sneezing and injected eyes, with fever lasting 48 hours, indicate measles. The local symptoms of sore throat are like those of any disease about the throat—thirst, difficult and painful deglutition, uncomfortable sensations and more

severe pain shooting earwards, worse when swallowing; cough, attempts at hawking, and possibly deafness with altered often nasal-toned voice. A nasal voice implies imperfect shutting off of the nose from the throat as the result of imperfect action of the soft palate. In neurotic, rheumatic, debilitated and tubercular children the treatment for the prevention of the habit of catarrh should be instituted (see p. 148). On being called to a case of the kind the first point should be to entertain the possibility of acute specific fevers. The bowels are usually confined, and the practitioner should order a mercurial purge—a few grains of Hyd. c. Cret., or one or two of calomel with compound scammony or jalap powder. I prefer the former for infants under two years, the latter for children above that age. The child should be kept in bed if there be much fever—102°—or if less fever be confined to one room. He may gargle the throat with chlorate of potash gr. x. to ʒi., with an equal part of warm water and ʒss. of a glycerine; many children object to this and other procedures. Cold wet compresses, well wrung out and frequently changed, may be applied externally; they should be covered with oil silk and fastened with a bandage. Hot fomentations may be used instead, or a layer of cotton wool simply to keep the surface constantly and uniformly warm. If there be much redness with a glazed surface and œdema, drop doses of tincture of aconite may be given every half-hour to a child three years old, until four or six drops have been given. The doses may then be given at longer intervals, say till twelve hours have gone by. This generally reduces the inflammation, moistens the surface, eases the morbid sensations and lowers the pulse and temperature. The gargling may be continued. Ice or iced water is exceedingly comforting, and does good to the throat. A five-grain dose of Dover's powder may be given to a child five years old at night time to relieve the throat symptoms, moisten the skin

and quiet the restless nervous system and pulse. When the local inflammation has almost subsided astringent gargles may be used—alum gr. x. to ʒi.; or may be sprayed with a Seigle's apparatus. During convalescence the child may suck a lozenge of chlorate of potash, a compressed tablet of the same, or a tannin lozenge if he cares to or does not object.

The *food* should be of the fluid kind—barley water, mutton broth, milk—during the febrile stage; later, good nourishing diet in the form of meat, eggs, custard and jelly may be given. If the child be feeble or strumous, a little brandy or port wine or high-class claret, may be given as soon as the fever has subsided. Great care will be required to restore the child to health, if he were healthy before; to prevent the glands from becoming enlarged, and to alter as far as possible his diathetic condition (see p. 148.) In *rheumatic* children the sore throat may be the first term in a series of rheumatic phenomena, which may be more or less compressed into an attack of rheumatism, or may be rarefied into a straggling process. A *stiff neck* is common with the rheumatic sore throat, more common than with ordinary catarrhal pharyngitis. In some children, not necessarily rheumatic, there is a great tendency to the recurrence of sore throats from the slightest exciting cause. In these it is recommended to attend specially to outdoor exercise, gymnastics, massage, and a daily cold bath.

## QUINSY.

Repeated attacks of quinsy lasting a few days, beginning and ending with a finish suggestive of a fit of epilepsy, are very common in some children during the second seven years of life; each attack may be followed by an increase in volume of the organ after the acuteness of the inflammation has subsided; a slow hypertrophy may occur in strumous subjects and in others. Acute tonsillitis may be a rheumatic phenomenon. (See Rheumatism.)

That a chill is always the cause of the quinsy is not always provable; perhaps the tonsillar irritation sometimes proceeds from within, the result of faulty digestion or metabolism, the blood being charged with a great quantity of "fatigue products." This view would ally some cases of quinsy to gout and rheumatism. Undoubtedly a vitiated atmosphere, as in hospital wards with many suppurating wounds, or an atmosphere charged with moisture and emanations from the drains and sewers, are powerful causes.

Sudden onset with fever (103°), vomiting, lassitude, aching pain in the throat and radiating up to ear, dysphagia, rapid pulse and sense of chilliness are the customary chief symptoms. The tongue is coated with a creamy fur, the skin is moist and clammy, the tonsil or tonsils look dry, glazed, deep red, and swollen; hawking, deglutition, coughing, mastication, speaking and opening of the mouth are avoided on account of the pain. The voice is nasal and liquids may regurgitate through the nose; the misery and depression is most intense. I believe some cases would wisely be called—epileptic tonsillitis; the mental and vasomotor symptoms are dominant beyond inflammatory bounds, recalling the severe cerebral symptoms of mumps, in which motor brain symptoms and lesions may occur. There is great tenderness, and sometimes swelling behind the angles of the jaw. In a case of this severity the fever keeps up, the misery continues till four or six days have elapsed; the tonsil but seldom suppurates or bursts spontaneously in children. Sometimes another week of misery follows owing to inflammation supervening in the other tonsil; all cases do not end in abscess, especially not if treated early. The sudden onset of tonsillitis is quite unlike the ordinary run of diphtherias; the follicular cheesy stuff of tonsillitis is not like the ordinary grayish layer of real membrane; moreover, indurative glandular enlargement is not met with in quinsy. The punctiform uniform

bright red hyperæmia and more considerable œdema of the palate of scarlatina will usually suffice for the diagnosis even before the skin rash appears.

The **prophylactic treatment** of quinsy should be the doctor's chief consideration : Exercise, gymnastics, massage, cold bathing, systematic daily gargling and protection of the neck and chest, as well as of the whole surface from cold and damp by uniform woollen clothing.

Not unfrequently the attacks are clearly traceable to insanitary defects in the house and drains. Removal to another part may be followed by restoration to health and freedom from further attacks. For the actual attack the weapons are a purge, compresses, gargles or sprays, aconite, iron and quinine, liquid diet, ice to suck, and wine.

The mercurial purge comes first and foremost ; two grains of calomel and ten of compound jalap powder for a child seven years old. It reduces fever, unloads the bowels, tends to clean the tongue, abates the inflammation and makes the patient and his throat more comfortable. Plenty of ice to suck, frozen or cold mutton broth, beef tea or milk, are the foods required. In cases resulting from sewer emanations there may be need for stimulants ; the fever is usually less ; there is more depression of vitality as seen in the frequent pulse and delirium ; these cases, if suspected, should be treated by instant conveyance to a healthier region ; the journey, properly managed, may do no harm. *Aconite*, to be of any good, must be given early in drop doses every half-hour, the intervals being gradually increased ; twenty drops may be sufficient altogether ; if it is doing any good the skin will become moister, the pulse less bounding, and the tonsil less glazed ; it follows that the cases in which it will do most good are those with excited circulation, tense tonsil and high fever ; not the septic cases.

It should not be continued after twenty-four hours. Then order :—

℞ Tinct. Ferri Perchl., ♏v.
Quinæ Sulph., gr. ii.
Magn. Sulph., gr. xv.
Glycerine, ʒss.
Aq., ℥ss.

for a child seven years old four times a day.

If the tonsil has not been reduced by the foregoing treatment, another purge as before and the thrust of a sharp bistoury into the tonsil with sequent bleeding may be good treatment; the bistoury should be guarded by wrapping it up in a strip of strapping, or a Paget's knife will do quite well in children who are frequently manageable enough; the complaint is far more common in those who are some years old.

Frequent *gargling* with chlorate of potash gr. x. to ℥i, and as much warm water with a dram of glycerine, or inhalations of steam medicated with carbolic acid 3i. to Oi., or pumiline 3i. to Oi. should be assiduously performed to give comfort and lessen the offensive odour of the breath. Cold wet *compresses* should be applied, changed every hour and covered with a layer of oil silk and cotton wadding.

*Poultices* of bread and water or linseed meal, hot fomentations, or hot spongiopiline may be used instead. The employment of *leeches* behind the angle of the jaw has been used in children in the early stages of inflammation. If suppuration occur, as may be felt by the forefinger applied to the tonsil, a puncture will give immense relief.

When all acute symptoms have subsided the iron and quinine should be continued without the sulphate of magnesia. The food must be nourishing—meat, eggs, milk, and a little rice or custard pudding, fresh vegetables and a little wine—half-a-glass of port or a glass of claret to dinner. Astringent gargles of alum, tannin or nitrate of silver may be used to help the gland in returning at least to its usual size. For the treatment of large tonsils see p. 302.

℞ Alum, gr. x.
Liquefied Honey, 3i.
Aq., ℥i.

℞ Glyc. of Tannic Acid, ♏xxx.
Aq., ℥i.

℞ Nitrate of Silver, gr. x.
Glyc., ʒi.
Aq. destil., ʒii.

**Chronic Sore Throat.**—Sometimes the chronic sore throat is simply a relaxed congested freely secreting throat; generally there are adenoid overgrowths beneath the mucous membrane —granular pharynx. The children are often debilitated, if not strumous, and are troubled with cough and in the pharynx tickling sensations which induce hawking. More or less deafness is frequent, owing to obstructions, either by the growths or by mucus, of the openings of the Eustachian tubes. The cough may be obstinate and distressing. Chronic laryngitis is associated sometimes with chronic pharyngitis. The cough is worse on going to bed and in the early hours of the morning—at the time when the vitality of the body is at its lowest ebb. The period of life at which these cases are seen is after the commencement of the second dentition.

Apart from the feeble vitality of these children's protoplasm, humidity of climate is a great cause of the adenoid growths and of the hypertrophied tonsils which often accompany them. It is most necessary to see that the dwelling-house is dry and situate on a dry soil. The seaside at a high elevation with perfect sanitation is the best climate for these children, though a dry inland air may be better. Follicular matter of opaque, often cheesy material may be seen on the tonsils and on the adenoid follicles which may be associated with mucous polypi about the nose. Without this complication they may, if severe, cause obstruction at the posterior nares, with consequent shelving and flattening of the nasal bridge; the same sort of thing happens to the membrana tympani from obstruction of the Eustachian tubes; there is overcupping of the membrane, and often some thickening of it. Besides the climatic treatment every care must be given to the dietary and digestion, as in struma (q.v.).

Cod-liver oil (ʒi.) and iron wine (ʒi.) should always be prescribed (see p. 68), and are, as a rule, taken without trouble. Syrup of the hypophosphites (ʒi.) or phosphates (ʒi.) of iron may be given instead. Quinine (gr. i.) in any form, or better, the Liq. Ext. of cinchona (ɱiii.) and dilute nitromuriatic acid (ɱv.) may be prescribed in glycerine and water for a child seven years old.

The topical applications are numerous. I generally use equal parts of liquor ferri perchl. fort. and glycerine applied to every accessible part by means of a camel's-hair brush. A solution of ten grains of nitrate of silver to the ounce of distilled water may be mopped all over the pharynx and on to the epiglottis when the cough is very obstinate. The cough may be treated as described on p. 150. If the growths are large, and do not yield to the whole treatment above indicated, the galvanic cautery should be used by the surgeon. Some prefer the application of strong caustics, such as the solid stick of nitrate of silver or scraping. Whether the thermo-cautery or the caustic be used only a few growths should be attacked at one sitting, and care should be taken that the child has not to go out into the cold damp air afterwards. It is best to keep him or her indoors for a day or two after this surgical treatment has commenced.

### CHRONIC HYPERTROPHY OF TONSILS.

Sometimes the tonsils are large and soft; sometimes they are less large, but scarred and ridged by fibroid changes. They may meet in the middle line, and rub against one another till ulceration occurs. Such enlargements cause the nasal bridge to shelve and flatten out, and the lower parts of the thorax to fall in—so often that deformity results. Transverse and lateral constrictions or true pigeon breast may result. These children are often wasted and pale, and very liable to suffer from constipation or diarrhœa. The mothers often say that they come over "so pale, so ghastly white."—Vasomotor epilepsy.

Snoring at night time and nasal voice during the day are usually observed; the mouth is kept open, and the expression has often an imbecile look, due partly to deafness.

**Treatment.**—The tonsils should be excised, but not if any acute inflammation be present which should be first treated.

Debility, deformed thorax, incessant coughing and thoracic disease are signs for urging the excision of the tonsils. Large tonsils not producing these signs in children a year or so before puberty, need not be excised. The tendency for enlargements to disappear with the accession of puberty may be remembered.

Change of air and scene, exercise in the open air, gymnastics, massage, good nourishing food, attention to bowels and digestion, cod-liver oil and steel wine (see Scrofula, p. 66), are the general therapeutic measures. Long discussions cannot increase my sense of the great importance of these agencies. Nothing is of such vast importance as seasonable clothing; in doubtful weather the whole surface of the body, but especially the neck, chest and arms must be covered with woollen raiment; this applies to all affections of the throat.

For the local and other treatment see the preceding page.

The tickling sensation and resulting cough in the throat may be relieved by mopping the fauces and pharynx two or three times a day with a four-per-cent. solution of cocaine or with glycerine of tannin.

The rickety state and strumous diathesis may be partial causes of hypertrophy (see the treatment of Rickets and Scrofula).

*Gymnastic exercises* are very valuable in removing deformity of the chest. The horizontal bar, Adam's inclined plane or the trapeze may be used indoors; the ordinary drill exercises are efficient.

The best way of treating deformity is to prevent its becoming chronic by advising removal of the tonsils; it is no argument against excision that the hypertrophy recurs. The apprehension that the genital organs may atrophy if the

tonsils be excised is admitted on nearly all hands to be groundless. The truth is that large tonsils, small testicles and defective moral behaviour are in my experience not unfrequent combinations.

### TUBERCULAR ULCERATION OF FAUCES.

It is not easy to distinguish at first sight syphilitic from tubercular ulceration, unless the case has been seen from the first. The cases which I have seen were already very extensive, involving fauces, palate and pharynx.

Syphilitic ulcerations are generally deeper, with sharper-cut edges; there is a tendency to fibroid scarring owing to the vascularity of parts of the syphilitic infiltration. The tubercles break down at one part; grey granulations, more translucent, are seen around the ulcerating areas; the edges of the ulcer are rough and nodular and the base shallower than in syphilis.

The cervical glands are enlarged but not very hard in both diseases; perhaps larger in the tubercular variety. Fever may be present in both ulcerations; the hectic type of fever is in favour of tubercle; syphilis may be altogether afebrile; tubercle may be afebrile but is usually not so. The diagnosis is aided by the personal and family history either of syphilis or tubercle. Signs of breaking down in the lungs are almost clenching; a large spleen may be tubercular or syphilitic; syphilis and tubercle may coexist.

At the outset the disease may be mistaken for tonsillitis, owing to the pain and dysphagia; for diphtheria owing to the whitish spots fever, pain, and dysphagia; and for herpes of the pharynx (Percy Kidd). A great feature of some cases is the enormous amount of viscid mucus and muco-pus which obscures the ulceration, and wells out of the mouth and nose.

Deglutition is very difficult, and regurgitation of fluids occurs through the nose. The patient must be fed with the

nasal tube; the diet and hygiene must be regulated by the tuberculosis of other organs which always coexists. Death is certain in this disease, though not necessarily from the throat condition, which only appears as a rash a few weeks before the fatal termination. Struma as well as syphilis is credited with the power to scar the pharynx in such a degree as to shut off the nasal from the pharyngeal cavity by adhesions of the soft palate to the parts around.

The general principles of **treatment** consist in the administration of nourishing food, pounded meat, eggs, milk, and stimulants—by the nasal tube at regular intervals; and by attention to local antisepsis. Syringing, spraying, swabbing, and gargling the throat and nasal douches may be practised with a view to reducing the amount of secretion and the degree of the stench. Any of the antiseptic applications used in diphtheria may be tried. The distress and misery may be relieved if necessary by opiates. Finely-powdered iodoform may be blown on to the surface and into the nose by the insufflator. The child should sleep on its side to prevent choking and disturbance from the secretions, and to allow of their ready escape.

## HERPES OF PHARYNX.

Sometimes pharyngeal herpes complicates labial herpes, but not always. The complaint consists in the development of a crop of vesicles, somewhere on the fauces, usually on one of the pillars. The vesicles are seated on a hyperæmic base, there may be some swelling. The glandular enlargement at the angle of the jaw on that side is trifling. The disease may be mistaken—probably often is—for diphtheria, because the vesicles when macerated look like exudations; slight shallow ulcers may be left. The complaint is attended with slight fever, 100°-101°, thirst and often much discomfort; pain shooting up to one ear, as in tonsillitis, is common.

**Treatment.**—A dose of castor-oil, or, if the tongue be much loaded, two grains of calomel and seven of compound jalap powder may be given to a child of seven.

Chlorate of potash gargle, gr. x. to ʒi. should be used frequently, sprays of sanitas with Seigle's apparatus, or carbolic acid, 1 in 100, if gargling is not possible. Fœtor would need the use of garglings and sprayings more frequently. As a rule the fever subsides after the purge.

*Cold wet compresses*, hot fomentations, or rubbing the neck behind the angle of the jaw with a little chloroform and opium liniment, may be used to relieve the pain; thus:—

℞ Tinct. Opii, ʒii.
Chloroformi, ʒii.
Lin. Camph. Co., ʒiv.
Lin. Saponis, ʒi.

The child should be kept in one room, with plenty of cubic space and ventilation, out of draughts, on a liquid diet of mutton broth, beef tea and milk for a day or so. Ice may be sucked to relieve morbid sensations. Stimulants are seldom necessary. A grain of quinine disguised in glycerine is the best medicine. Dr. Morell Mackenzie recommends *Fowler's solution*, three drops three times a day with the food to a child four years old. I have not used it, and it was unnecessary in the six cases that I have seen. A camel's-hair brush charged with five-per-cent. solution of cocaine may relieve distressing faucial sensations, if applied neatly to and around the painful part.

## CHAPTER XII.

### ABDOMEN.

The belly in infancy and childhood is, owing to several causes, of larger size than in the adult. Mention may be made of three chief reasons—the smallness of the chest and pelvis, and the large size of the liver. The belly is a most necessary part of the organism in childhood; therein are contained those organs which make nourishment for the rest of the body, and for the growth of the brain especially. In later life the brain, respiratory and pelvic organs assume a greater activity, whilst the demands on the abdominal organs are lessened.

Palpation is the most useful form of physical examination. Inspection and percussion give some information. Auscultation rarely teaches much. The belly must be examined when the walls are lax; this relaxation must be secured somehow; sometimes sitting up, sometimes lying on the back in the mother's lap is the best position. Older children may lie on the couch, the knees may be drawn up and the examination made with the mouth of the child open, as in the adult.

The size of the belly may be increased: (1) From flatus (acute or chronic tympanites); (2) from fluid (ascites and other effusions); (3) from tubercular disease and new growths.

**Abdominal Tumours.**—The liver may be greatly enlarged from disease; active congestion, associated with gastro-enteric catarrh; passive mechanical congestion from heart disease;

lardaceous disease and fatty change. Rickets, syphilis, hydatid disease and new growths may cause enlargement of the liver. *The spleen* may form an abdominal tumour; syphilis causes the spleen to enlarge; pure rickets probably does not, though most physicians assert this. In so-called lienosus the spleen may form a considerable tumour, and may be accompanied or not with leukæmia. Lardaceous or waxy disease increases the size of the spleen. I have seen hydatid cysts in the spleen in a child aged three years. *The kidney* is not unfrequently the seat of malignant disease, nearly always sarcoma. Hydronephrosis, pyonephrosis, and cystic disease are met with in children. A psoas or iliac abscess may form an abdominal tumour. *The mesenteric* glands may be the seat of tubercular enlargement and disease (tabes mesenterica), as well also of new growths (lymphadenoma, lymphosarcoma). *Tubercular peritonitis* causes swelling of the belly, scattered indurations or lumps may be felt, and collections of fluid, even ascites and tympanites may appear. *Sarcoma of the large bowel* and *parietes* must also be borne in mind.

*Ovarian disease* occurs in girls, but not frequently; it is usually malignant; *abscesses in the abdominal wall* may simulate abdominal tumours. There are such things as "*phantom*" tumours even in children.

## ACUTE GASTRIC CATARRH AND GASTRITIS.

This chapter must be regarded as a further development of that on Indigestion and Dyspepsia—simple gastric catarrh. It is inferred that simple gastric catarrh exists in indigestion and dyspepsia, but this may be so slight as scarcely to deserve a designation signifying inflammation. More severe degrees of gastric catarrh may be due to bad feeding and cold-catching in partially devitalized constitutions; to cases in which a more powerful irritant has been at work—very

hot or cold water, foreign substances such as chalk, coal, alcohol in some quantity, sauces, and lastly arsenic, antimony and mineral acids. The arsenic may be inhaled from wall papers. The symptoms are simply more violent than those given under Indigestion; *nausea*, *retching*, *vomiting*, *pain*, and *epigastric tenderness* may be severe. There is a greater tendency to *collapse* with its sunken eyes, dark areolæ, empty, anxious, bloodless face. Of course these are matters of degree ; they may be more or less marked, according to the strength of the irritant and the feebleness of the child; thirst is urgent and appetite is lost. The vomit may be coffee-ground-like, or contain blood and bile along with mucus. There is usually fever, which may be as high as 104°. The nervous prostration may appear as great restlessness at night and marked drowsiness during the day-time, unless there be complete collapse. Collapse may pass into coma with its peculiar vigil, its hollowed eyes, unduly exposed sclerotics, empty moist skin, small or absent radial pulse—symptoms indicating the near approach of death.

Gastric catarrh, if attended with fever and diarrhœa, may simulate typhoid fever so as to be undistinguishable from it. In simple gastro-enteric catarrh I am convinced the spleen may be found enlarged in infants. Typhoid fever may last only fourteen days; there may be no spots, no decided enlargement of spleen, no distinctive stools; a little bronchitis may accompany gastric catarrh. If there be a cause for the gastritis, and if there be no other cases of enteric fever about the same time or in the same neighbourhood, the diagnosis may be aided.

The **treatment of gastritis** is conducted on the same general principles as indigestion. *Emetic* and *purgative.*—The stomach must be emptied and the bowels cleared; in great collapse these should be prohibited, or given with stimulants and caution.

The child must be kept in bed and every care taken to keep it warm and to see to the ventilation. A mustard plaster for ten minutes over the epigastrium, or frequently renewed hot linseed poultices, care being taken to avoid chill, or spongiopiline or hot fomentations may be applied as *counter-irritants*. The great thing is to leave the stomach alone and at perfect rest. Vomiting must not be allowed to continue. It may be controlled by iced water, iced brandy or champagne, and opium—Dover's powder, gr. i., repeated frequently, or morphia under the skin, gr. $\frac{1}{12}$ for a child three years old. If due to a mineral acid the gastritis may be locally relieved by a leech or two at the epigastrium, followed by fomentations.

Nutrient enemata of peptonised meat, milk and gruel, or a peptone suppository (Savory and Moore), may be given if the case be severe, and especially if the child be a few years old. If food be permitted, small doses (even a teaspoonful) of cold whey, cold koumiss, cold mutton broth, veal tea, or what not, will suffice, with brandy and champagne should the feeble pulse or collapse indicate their employment. Sucking small fragments of ice or very hot tea may relieve thirst. Cases so collapsed as to need hypodermic injections of ether (mx.) rarely recover. The alkaline carbonates of soda (gr. vi.) or potash with subnitrate of bismuth (gr. vi.) may be given with mucilage in cold water, and a drop of dilute hydrocyanic acid added thereto.

Great care must be taken to keep the extremities of the child, and also the whole of its surface, warm. The belly should be swathed in cotton wool, and the chest also; the limbs may be enveloped in cotton wool, and hot bottles placed near, not in contact, with them. The internal temperature may be high. If there is extreme collapse, cold baths must be out of the question; a cold pack may be employed if the internal temperature of the rectum transcend 104°; there may be need for free stimulation as indicated by the pulse, the heart

and the depressed fontanelle of infants. When recovery is taking place the food will have to be regulated with great nicety. Raw meat juice sweetened and diluted, whey, pancreatized foods in small and frequent doses, rather than large doses at long intervals, may be used. Cow's milk, arrowroot and sugars should be avoided. A peptone suppository may be placed every six hours in the rectum.

Should recovery ensue, tonics are needed to round off the case. Tinct. of nux vomica may be added to the alkali. Mineral acids may be given with bark; see p. 293 for many tonic formulæ. The various syrups are useful, though some object to saccharine tonics. Syrup of the phosphates of iron and lime ʒi., or Easton's syrup (ɱxv.) of iron, quinine and strychnia, or Lorimer's compound syrup of the hypophosphites (ɱxv.) may be prescribed for a child seven years old three times a day.

## SEVERE OR INFLAMMATORY DIARRHŒAS.

Under this heading I shall deal with at least three different sorts of severe diarrhœa. In all of them it is necessary, if possible, to remove the patient from the locality in which the disease was contracted, to see that abundance of fresh cool air and light are supplied; to substitute comfort for the discomforts of poverty, should the child be of poor parentage as so often happens; to attend to the diet and drink. The great heat* and drought, with the usual attendant circumstances of summer in populous cities and large towns, from which defects of drainage and sewage and decomposing organic matter of animal and vegetable nature are seldom absent—are proven causes of these diarrhœas. Therefore if it be possible the child should be removed to some distance from the city, and to a place where the sanitation is perfect,

* See a paper in the "Occidental Medical Times," by Dr. Dawson Williams, October, 1889.

where no bad smells from defective drains or unguarded cesspools impregnate and pollute the atmosphere, soil, water and food.

These directions apply not only to children who are ill already, but to children generally. I have strongly insisted on the importance of all children under the age of seven years not living in large towns or crowded cities. The country seat should be well drained and free from excessive humidity, because there are grounds for believing that some of the diarrhœas own a *malarial* or a *septic* cause, and moisture of a certain degree favours the growth of such causes.

All children are not equally liable to suffer from severe inflammatory diarrhœa. Those which are ill-cared for in any way, especially the hand-fed; those which are already debilitated; and the subjects of actual disease, like rickets, scrofula, heart disease, bronchitis and cirrhosis of the liver, are more prone to develop these severe diarrhœas.

Repeated cold-catching, bad feeding and the constant ingestion of impure water, are most potent agents in developing that state of body and of bowel in which these severe diseases delight to arise. All these causes appear to be more effective in the hot months—like thrush, stomatitis, indigestion, simple diarrhœa, simple catarrh. The younger the infant is the greater is the liability to suffer; the more severe the disease; the greater the mortality; the more frequent the cerebral symptoms—spurious hydrocephalus and nephritis with uræmia. I believe that the brain and the kidneys suffer together from the anæmia and toxæmia and *low* blood pressure attendant on prolonged collapse; the effect is of course greater the feebler is the vitality, and therefore *cæteris paribus* the younger is the infant. If the reader has already read the chapter on general hygiology (so far as concerns clothing, diet, and exercise), nothing further need be said on the prophylactic treatment of these summer diarrhœas.

Of the **summer diarrhœa** mostly of teething infants, which is well called **cholera infantum** and **choleriform diarrhœa,** the principal symptoms are vomiting, copious serous stools, great thirst, rapid tendency to collapse, high temperature internally, with nervous irritability ; cyanosis, coma and convulsions (spurious hydrocephalus), rapid shallow breathing, pulseless wrist, sunken fontanelle and eyeballs, with leaden-hued areolæ.

The treatment of this diarrhœa must necessarily be chiefly carried out by the nurse, who should be thoroughly capable. Specific instructions should be given. The case resolves itself principally into the treatment of symptoms. As specific remedies have been praised, these will be indicated at the end of the chapter, but I can place no great faith in them.

Of course the child will be placed in a cot, and, if a collapsed infant, it must be kept thoroughly warm by cotton wadding clothes, which should especially be arranged so as to keep the abdominal surface at a uniform temperature, and by hot bottles near the body if necessary. The arteries may be nearly empty in this disease, so the skin, kidneys, brain and liver have but little blood, and do but little work. And there is not much blood in the veins if the diarrhœa and vomiting have been profuse. If the *collapse* be rapidly developed, our hope must lie in free external stimulation by repeated mustard applications. The indication for these baths is an empty skin and pulse with a cold and blue surface. A table-spoonful or two of mustard to two gallons of water, at a temperature of 100° F., and for ten minutes, or until the skin has reddened, or the arms of the nurse begin to tingle strongly, is the best method. *Mustard plaisters* may be used over the heart region, say for ten minutes. *Friction* of the surface of the body with hot water may also

be tried. Brandy in ten-drop doses should be given as frequently as necessary in soda water or iced water; iced champagne is also good. So much for combating collapse.

*Vomiting* is most difficult to abate, but small teaspoonful doses of iced or cold watery fluids will generally be retained. Too much fluid should not be given, if it can be kept down, in the early stages, for fear of feeding the diarrhœa. The brandy tends to abate sickness. The exessive *thirst* may be treated by small doses of iced or cold drinks. The best fluids for this purpose are iced water, cold or iced whey, cold thin barley-water, thin sweet raw meat juice, thin mutton broth, weak beef tea, weak chicken tea and weak veal tea; some of these will usually remain on the stomach. It is the worst possible thing to give any form of fresh milk, and even the mother's milk had better be withheld for a day or two. The reason is the same as the reason for not giving arrowroot and other starches, the stomach and pancreas are most likely *hors de combat*, and any curd of alkali albumen, even if thoroughly divided, would probably undergo no solution whatever; the same with starches. Sugars, as in condensed milk, might only increase the mischief, because, absorption being almost in abeyance, much of the sugar would remain and ferment.

This is the kind of treatment in severe typical cases. The ventilation of the room is as necessary here as elsewhere; all soiled napkins and vomits must be removed as soon as they have been passed by the infant. The napkins should be at once plunged in carbolic acid solution 1 in 40; and every care taken to keep the furniture, bedding, linen and clothing sweet and clean; the child's skin must be cleaned carefully, and the buttocks well dried and oiled to prevent excoriation.

If medicine can be kept down I always prescribe bismuth in large doses:—

℞ Bism. Trisnit., gr. x.
Mucilag. Trag., ℥xx.
Aq. Chlorof., ʒi.

for a child seven months old every six hours.

An enema of five drops of laudanum, in thin gum-water, may be injected between the stools; or tinct. opii in drop-doses may be added to the mixture; but the effects of the opium should be most carefully watched.

*Nervous irritability* may be best combated by tepid baths at a temperature of 75°-80° F., and this will serve to reduce the temperature also, should there be much internal fever, as is usually the case.

The *wet pack*, or *cold wet cloths*, may be used for the same anti-pyretic and soothing purposes. The water should never be cold (60° F.) if the collapse or emptiness of external parts of the body be great. A tablespoonful of mustard may be placed in the tepid bath, and may tend to bring some blood to the surface of the body.

Many cases of this infantile cholera prove fatal, but some recover, though not if the collapse be profound a few hours after the onset of the diarrhœa; robust children are more likely to recover than feeble ones.

Should recovery be about to take place the collapse is gradually replaced by reaction; absorption of liquids from the stomach and intestines improves, the internal heat disappears; but the feeding must still be carefully done. The infant may return to its breast, but only at intervals of—say six hours—so as to give the gastric and duodenal secretions as little to do as possible; the other meals should still be weak, watery and cold. Gradually the diet should be increased in albumens and fats, but care must be taken to guard the cow's milk with isinglass or barley-water to prevent the formation of large curds. One part of cow's milk with three parts of barley-water may be tried first. Some cream may be shaken

up with the whey, or Mellin's food may be given dissolved in whey. Next the yolk of an egg, strewn through thin broth, may be tried—a little at a time, whatever it is. And so the diet may gradually assume the normal, but care should be had, supposing the child to be two years old, not to give much solid food till some days in convalescence have elapsed; too much potato, rice, meat, vegetables, fruits or jams should be carefully guarded against, indeed the child should be considered as an invalid for weeks after an attack. The *prophylactic* treatment, as indicated at the commencement of this section, will be most necessary. Tonics of cod-liver oil and steel wine may be prescribed as recommended on p. 66. The belly surface must be protected by close-fitting woollen clothing.

*Intestinal irrigation* by copious injections of medicated warm water have been employed for infantile cholera, *e.g.*, nitrate of silver one grain to the ounce. As much as one to two litres are irrigated by means of an ordinary irrigator placed at first so as not to give too high a pressure. Straining on the part of the infant is a sign to discontinue the injection. Some advocate cold, some very hot, water irrigations; these deserve further trial.

Of **other medicines** than bismuth and opium there are enough and to spare, but I cannot speak highly of them, for they mostly fail in the severe cases to effect improvement; and in the milder cases it is difficult to say whether nature and other treatment alone might not have effected the benefit ascribed to the drugs; on this point there must always be some difficulty of decision. If the bowels remain loose after the fever and other bad signs have disappeared, the various *astringents* mentioned in the next chapter may be tried. And all I will say further is that fractional doses of (gr. $\frac{1}{6}$) mercury with chalk; bromide of potassium, in two or three-grain doses, every four hours; a tenth of a grain of nitrate of silver six times a day for pus-like, mucoid and bloody, as well as serous stools; salicylate of soda, iron or lime in grain doses several times a day; ipecacuanha wine and spirits of camphor in one-minim doses every hour; hypodermic injection of nearly neutral sulphate of

morphia, have all been recommended for this diarrhœa. All the doses mentioned are for an infant one year old. Dr. Eustace Smith speaks strongly of the hypodermic injection of morphia if employed before collapse has set in. The dose should be a small one, gr. $\frac{1}{20}$, for a child a few months old.

A tincture made of one part of cocoa leaves and five parts of absolute alcohol has been employed with success in doses of a few drops given in water or syrup every hour. After taking fifty to a hundred drops the vomiting and diarrhœa and the collapse had abated considerably.

Dr. J. Strahan speaks highly of creasote $\mathfrak{m}\frac{1}{6}$, tinct. of iodine $\mathfrak{m}\frac{1}{2}$, Mist. Camph. 3i., every half hour, or more frequently if emesis reject it, but it soon stops sickness. In between this medicine gr. $\frac{1}{12}$ calomel, or gr. $\frac{1}{3}$ Hyd. c. Cret., is given in sugar of milk gr. iii. or magnesia. As the diarrhœa abates the medicines are given less frequently. No milk should be given, but barley water with fifteen drops of port wine frequently. He believes with Bartholomew that opium is harmful when the kidneys and liver are not acting, as happens in severe gastro-intestinal catarrh. Nitrate of pilocarpin in sweating doses deserves a trial.

Resorcine in grain doses has been prescribed to infants a few months old; it is given in some aromatic water (chloroform, caraway, aniseed); some give syrup with it. Transfusion might be resorted to as a last resource.

In that form of severe diarrhœa which is usually called **inflammatory,** the stools are characterised by their changing characters in colour and consistence, but not in odour, and they contrast with the simple serous stools of the infantile cholera. All forms of diarrhœa tell with greater force on infants than on children above two years of age. This is expressed in the greater severity of the collapse, fever and tendency to cerebral symptoms. Hence "*spurious hydrocephalus*," with its coma and convulsions, is more frequently seen in infants than children. The treatment of this severe form of diarrhœa must be carried out on the general lines laid down for the treatment of choleraic diarrhœa:—The ventilation, the bedroom, the clothing and protection of the belly, the dietary, stimulation by baths and brandy, reduction of fever by tepid baths and wet packs; and the calming of

the nervous system by the same means. This is the form of diarrhœa to be mostly treated with *alkalies*, *antiseptics*, *astringents* and *opiates*, given internally. All of these classes of remedies are certainly of value. The litmus paper applied to the stools reveals an acid reaction of them; this acidity is doubtless the outcome of fermentative processes, therefore any agent, whether it be alkaline or antiseptic—and some of the astringents are both alkaline and antiseptic—would tend to prevent the occurrence of fermentation. It will be remembered that the danger at first is from collapse; the indications are to combat this as well as to relieve the thirst, subdue the vomiting, and check the diarrhœa. The fever, as ascertained in the rectum, is a measure of the severity of the case; yet in the most severe cases tepid baths (85° F.), with mustard therein, are far more indicated than cold water to abate the fever. If the case be mild from the outset, or when the first brunt of the disease is over, then the time for medicines has come. Begin with injections after each liquid stool of liquid extract of logwood ʒi. to ʒi. of water, held in the rectum by gripping the anus sufficiently firmly for a few minutes till absorption has taken place.

℞ Bismuthi Trisnit., gr. x.
Sodæ Bicarbonat., gr. v.
Tinct. Opii, ♏i.
Mucilag. Tragac., ♏xx.
Aq. Chlorof., ʒii.

is useful for an infant seven months old, every four hours; care being taken to watch its effect, for at this age nephritis is apt to complicate the disease and render drowsiness more easy to develop under the influence of opium. Nevertheless, this drop dose four or five times a day when the stools number ten or so a day has seldom caused anxiety, though the case necessitating its use necessarily does. This form of diarrhœa, however, is one that calls for frequent *change of*

*remedies*, and whilst the bismuth may do good at first its influence may wear off. The hæmatoxylon mixture may then be prescribed :—

℞ Extract of Logwood, 2 grains.
Ipecacuanha Wine, 1½ minims.
Vin. Opii, ♏½.
Chalk Mixture, ʒi.

four times a day for an infant six months old; or this :—

℞ Liq. Ext. of Red Gum, ♏v.
Glycerine, ♏x.
Spt. of Chlorof., ♏v.
Peppermint Water to ʒi.

or this :—

Tinct. of Perchl. of Iron, ♏2½.
Glycerine, ♏xx.
Aq. ad ʒi.

Or these prescriptions may be used in succession. They are those that have given me the best results.

Some practitioners use minute doses of calomel (gr. $\frac{1}{12}$), with Dover's powder (gr. i.), also Hyd. c. Cret. gr. ½ with the Dover's powder; but I have not tried them sufficiently to speak of their value, except in the dysenteric variety. Dilute sulphuric acid ♏v., with a drop of laudanum or dilute nitric acid and laudanum, may be tried. The following prescriptions will give a practitioner abundance of remedies should others than those mentioned be requisite :—

℞ Acid Nitric Dil., ♏ii.
Tinct. Camph. Co., ♏iii.
Decoc. Hæmatox., ad ʒi.

Recommended for diarrhœa with straining and when the stools are green, curdled and contain mucus.

or ℞ Vin. Ipecac., ♏iii.
Sodæ Bicarb., gr. ii.
Spt. Æth. Nit., ♏ii.
Tinct. Camph. Co., ♏iii.
Aq., ad ʒi.

Specially valuable when the stools are abundant, acid, slimy and bloody.

or ℞ Chloral Hydr., gr. i.
Tinct. Bellad., ♏i.
Glyc., ♏xx.
Aq., ad ℥i.

Especially indicated when the child is very restless.

or ℞ Ext. Belæ Liq., ♏xv.
Syr. Gummi Rubri, ♏v.
Glyc., ♏xx.
Aq., ad ℥i.

or ℞ Tinct. of Catechu, ♏x.
Spt. of Chlorof., ♏v.
Mist. Cretæ, ad ℥i.

or ℞ Acidi Gallici, gr. i.
Tinct. Opii, ♏i.
Syrupi, ♏xx.
Aq., ad ℥i.

or ℞ Plumbi. Acet., gr. i.
Tinct. Opii, ♏i.
Syr. Zingib., ♏x.
Aq. Menth. Pip., ad ℥i.

The last prescriptions are most valuable when purging is frequent and stools copious. Any of these for an infant one year old four times a day.

Dr. Northridge speaks highly of three grains of *salicylic acid*, two of prepared chalk, and a dram of syrup, given every two hours to a child above six months of age.

Dr. Ryan believes in *belladonna*, which he says infallibly arrests both vomiting and diarrhœa. *Benzoate of soda* in doses of ℥i. in twenty-four hours, for two days running, preceded by a purge of calomel and jalap, has been recommended by Dr. Guiata. Lemonade and wine should be the only food. If at the breast the infant should be suckled every six hours.

As the diarrhœa abates the food may be given in larger quantities. When the child gets up care should be taken that its belly is protected from chills by a flannel jacket, fastened behind, and fitting evenly over the whole surface of

the abdomen, and this should be combined with flannel drawers and gaiters.

The third form of diarrhœa may be termed **dysenteric,** from the slimy and bloody character of the stools; it may complicate the second form just considered. Its onset may be fully as acute as any of the other forms, but it is more apt to become chronic and to begin in the milder form, which is known as simple or non-inflammatory diarrhœa.

The **treatment** of dysenteric diarrhœa will vary according as it is acute or chronic. If acute the same methods are to be adopted as in the two previous forms already considered. The dietetic treatment, as well as the management of collapse, nervous restlessness, and fever, should be the same as above directed. Try the injection method first and if it fail substitute mercury, with or without opium. The opium will be needed if there is much tenesmus and tendency to prolapse of the bowel, as is usually the case; liquor hydrargyri perchloridi ʒss. in Aq. ʒss. every four hours; or calomel gr. $\frac{1}{6}$ and Dover's powder gr. i. every four hours; the powder may be sifted neatly on to the back of the tongue. This treatment suits best in the early stage. A day or two later drop doses of wine of ipecacuanha may be given every hour, or the powder of ipecacuanha in $1\frac{1}{2}$ grain doses every two hours suspended in fifteen drops of mucilage, and with two grains of Pulv. Cretæ. Arom; these doses are for a child twelve months old. Half-ounce clysters of thin starch or mucilage of acacia containing five drops of laudanum may be injected twice a day if there is much *tenesmus*. Frequent bathing of the perineum and parts around with hot water and hot fomentations, on which a little laudanum has been sprinkled, are very comforting. The cases are rare which need a leech to the anal region. Cold compresses and starch poultices may be used. Irrigation is a very useful method of treatment; plain or medi-

cated waters have been employed, at varying temperatures; a hot douche to the rectum may be more soothing than fomentations outside. For the complete restoration to health after these severe diarrhœas a few weeks at the seaside in a part of the coast free from sanitary defects, with a dryish but not too warm climate, and a course of cod-liver oil and steel wine, are of immense value to the child.

## CHRONIC DIARRHŒA.

As has been indicated, either of the two last forms of diarrhœa are liable to become chronic, and may be attended with ulceration of the ileum and lower parts of the descending colon. The symptoms are frequently very variable. Diarrhœa may alternate with constipation; colicky pains may occur and be referred, as usual, to the umbilicus; tenesmus and prolapse of bowel may be present at one time, and disappear only again to return. There is usually tenderness about the descending colon, and sometimes in the right iliac fossa. There may be tympanites and enlargement of the superficial veins. *Tabes mesenterica*, or enlargement of the mesocolic and mesenteric glands, may supervene. The stools alter their characters considerably; not only may their number vary from day to day, but their consistence and colour also. They are always offensive, and generally contain much opaque slime. Sometimes hard pale rounded bullets of scybalous description are passed enveloped in bloody slime. The dejecta may be quite watery and brownish or reddish brown. Tarry and soot-like matters may be present, but probably do not always indicate ulceration, for the blood may come from simply congested parts; the consistence may be like thickish or thinner gruel; the stools may have the aspect of finely "chopped spinach," or they may be pale and pasty; the odour is not always that of putrefaction, but is generally intolerable.

The *diagnosis* of **ulcerated bowel** is often difficult. The most reliable signs are the passage of shreds of membrane or exudation and of sooty and tarry matter due to altered blood. Whether there be ulceration or not there may be emaciation, or the child may actually increase in weight, but is always flabby and liable to profuse sweating. The nervous symptoms are important; the child is very restless at night, screams often, and is usually very bad-tempered. The temperature is usually not raised above the normal, but there may be fever at times. Tenderness, local indurations, the character of the stools, and the general aspect of the patient, may suggest *tubercular peritonitis*, and the differential diagnosis is often difficult. Evidence of disease in the lungs, large glands in the neck, axillæ or groins, or persistent fever favour the diagnosis of tubercle, but none of these signs are trustworthy guides in doubtful cases. The *family history* may be worth something; other children may have died of tubercle or with scrofulous lesions; the younger the child is the less likely is the condition to be due to tubercle; but this consideration is not of much practical value; even great prolongation of the case is not certain evidence of the absence of tubercle.

The **treatment** of these chronic forms of diarrhœa consists largely in attention to hygiene, clothing, especially of the abdomen, thighs and buttocks, and to diet. The importance of keeping the belly surface at a uniform temperature is immense. Carded cotton wool covered with oil silk is efficient. The diet need not be so restricted as in the severe acute conditions. *Vomiting* is not a regular symptom unless there be an acute exacerbation. *Thirst* may be treated by small doses of iced drinks. Raw meat may always be ordered, but the stools should be daily inspected to see that it is digested, and that too much is not given. Antiscorbutic treatment is important. Greens

and most vegetables must be avoided, but one mealy potato first mashed and then baked, with a little salt, or a portion of the head of a cauliflower, thoroughly cooked and mashed into a purée, may be allowed. *Milk* is frequently ill-borne in these cases, and may be passed in large curdy lumps, apparently unchanged after the clotting in the stomach; boiled milk or barley water and milk is not always contra-indicated. The stools and the general condition of the patient must be the chief guide. Raw meat juice, preferably from mutton, is seldom rejected by the patient's varying appetite. The appetite must be regulated. These patients are often voracious, and at times have complete anorexia. Strange as it may seem, fresh orange juice or fresh lemon juice in dram doses twice a day is useful in the chronic stage, doubtless as antiscorbutics, though it is not affirmed that the cases are necessarily due to scurvy. Much sugar or much starch (fruits, sago, rice, arrowroot, potatoes, jams, &c.) are sure to keep up diarrhœa; limited quantities of these carbo-hydrates can be digested.

If the child be under one year of age the diet must not go beyond the range allowed at that period of life. Barley water and whey, perhaps milk according to circumstances, and Mellin's food, raw meat juice, white of egg or yellow of egg with water, mutton broth, weak beef tea is a sufficient list of foods. It is generally asserted that animal broths are deleterious in diarrhœa; used in small quantities cold, I have not noticed any prejudicial effect, and certainly the number of stools has not appeared to be increased.

There is no royal road to the prescription of medicines, but the methods I adopt are as follows.

If the stools contain much *mucus*, as is usually the case, I prescribe Mist. Ol. Ric. ʒii. four times a day for a child two years old. If this do not succeed, after a few days' trial, liquor hydrargyri perchloridi in ʒss. doses three times a day,

or three minims of wine of ipecacuanha may be added to the castor oil mixture. If the bowels act too frequently two drops of laudanum may be added to the mixture.

*Tenesmus* is best relieved by fomentations to the anal region and left iliac fossa, and by warm enemata of starch ʒss., and tincture of opium ♏v., and some add gr. iii. of Bicarb. of Potash. Red blood in the stools, with clots of mucus, probably indicates excoriation or ulceration of the sigmoid flexure or rectum. I greatly believe in local medication; irrigate slowly and carefully as much as a quart of water, the temperature varying in different cases from cold to hot; dissolve in this either nitrate of silver one grain to the ounce, salicylate of soda five grains to the ounce, or sodic chloride in the same proportions; the irrigation should be carried out every day for one month; this method appears to me to be most valuable in chronic affections of the mucous membrane and in the treatment of worms. Lay the patient on the left side with the buttocks raised on a pillow, some hours after a meal; struggling should not be allowed; it is legitimate to use chloroform to prevent pain and screaming.

At the outset of treatment for a few days purging doses of sulphate of soda, guarding the strength by nourishing food and sulphate of quinine and strychnia, will often be found of great service.

℞ Sodæ Sulph., gr. xv.
Quin. Sulph., gr. i.
Strych. Sulph., gr. $\frac{1}{50}$.
Acid. Sulph. dil., ♏i.
Syrup., ♏xx.
Aq. ad ʒss. t.d.s.

for a child of four.

Liquor strychniæ ♏i., or tinct. nucis vom. ♏ii., may be prescribed when matters are tending to mend, as indicated in the better character of the stools, the alteration in the temper

of the child, better sleep and less sweating. Liq. arsenic ♏ii., and ferri et ammoniæ citratis gr. ii., with a few drops of rectified spirit in two drams of water may be prescribed, also under similar circumstances, three times a day for a child two years old. The iron and the arsenic influence chiefly for good not only the general nutrition but the bowel condition. It may be necessary to prescribe, just before meals, the Mist. Gent. Alk. ʒii., with tinct. nucis vom. ♏ii., to promote or regulate appetite and digestion. Some prescribe Liq. Ferri Pernit. ♏i., Glyc. ♏x., Aq. Menth. Pip. ʒi. t.d.s. Now and again pancreatized foods of milk, meat and gruel, may be resorted to when digestion fails, as it does at uncertain times.

Small doses of old brandy or high-class port wine may be allowed with the meals—ʒi. of the former or ʒii. of the latter for a child two years old.

The stools should be narrowly watched. Abundance of *fresh air*, with perfect hygiene in the *nursery*, are absolutely indispensable. If there is ulceration, or if it is strongly suspected, the child should keep its bed.

Stools frequently and markedly changing in consistence and colour may be treated by half-grain doses of Hyd. c. Creta, with half-a-grain of Dover's powder four times a day. Generally if the castor oil mixture, which is most useful when there is more slime than other matters in the stools, fail, I use mercury, either as the bichloride or as grey powder; ipecacuanha may be added. The absence of bile in the stools is a pretty general indication for ipecacuanha and mercury.

I have tried the various directions indicated by Ringer, and can speak strongly of their general value, but I have seen but few cases in which it was necessary to give the bichloride or the grey powder in minute hourly doses.

The mercurial and ipecacuanha should not be continued indefinitely. A week or two at the most will yield all the benefit they are likely to afford as regular medicines.

Oil of turpentine (in ♏ii. doses for a child one year old) has been advocated for all painful affections of the bowels, and in dyspepsia and

enteritis; it is a valuable stimulant, and tends to check bleeding; it disperses wind in virtue of its anti-fermentative property.

℞ Mucilag. Acaciæ, ℥iss.
Sodæ Bicarb., gr. x.
Chloroformi, ♏x.
Ol. Terebinth., ʒss.

ʒi. every two or three hours for a child six months old.

Acorn cocoa, a preparation of ordinary cocoa, powdered and freed from fat, the soluble parts of roasted acorns, without cellulose, and a little sugar and roasted flour, has been highly prized by some in the treatment of vomiting and diarrhœa; it may be given in teaspoonful doses three times a day mixed with a little cold water, and then boiled, whilst constantly stirring; other food and medicine are prohibited for the time.

Further treatment of stools:—

Clay-like and sour—Pulv. Rhei gr. i., Sodæ Bicarb. gr. ii. placed on back of tongue. t.d.s. Infant six months old.

Later—Pulv. Ipecac. Co. gr. ½, Cretæ prep. gr. iii. every four hours.

Frequent and green—Tinct. Opii ♏i., Bismuth. Subnit. gr. ii., Cretæ Prep. gr. iii., Mucilag. Trag., ʒss. Aq. Menth. Pip., ʒi. t.d.s.

(Astringents, see p. 318.)

Baginsky recommended *irrigations* or enemata of warm water (half to two pints) containing a quarter to half per cent. of common salt, administered slowly and gradually, to get rid of all irritant matter which keeps up the excessive peristalsis. This method is of special value in the chronic gastro-enteric catarrh, with copious stools containing undigested matter. Should the stools contain much mucus and many leucocytes half a wine-glassful of Carlsbad water three times a day should be given. Thin slimy stools call for astringents (logwood, rhatany, catechu, etc.). He thinks peptonized milk of little value. Resorcin 5-grain doses in Syr. Aurant., and calomel gr. ¼ t.d.s., are also used.

Semtchenko has used a two-per-cent. solution of resorcin internally with good results in vomiting and diarrhœa in children; five minims for an infant a year old; effects narrowly watched. One-grain doses of *ingluvin* every four hours with a grain or two of sugar of milk has been tried successfully by Dr. Shelly, U.S.A.

*Liquor potassæ* in minim doses, with six drops of castor oil and a minim of laudanum, twenty drops of syrup of ginger in half-a-dram of

mucilage, given three times a day, recommended by Dr. Atkinson in presumed ulceration of bowels with a view of altering the secretions. The concentrated syrup of lactophosphate of iron and lime in water three times a day was used to improve the condition of the blood. Some authors altogether forbid the use of syrupy tonics in intestinal disease; as a rule I have not observed any harm to result from the usual doses.

Denaeyer's liquid peptone of meat is very useful.

## HÆMATEMESIS AND MELÆNA.

Bright red blood, fluid or clotted, when passed from the lower bowel in children, should suggest at least four possibilities : congestion, ulceration from any cause, intussusception and polypi. Generally speaking, the passage of blood and slime indicates merely a dysenteric form of diarrhœa, associated or not with worms, but he who neglects to think of intussusception and rectal polypi may make a serious mistake. The belly should always be carefully examined when blood and slime, however little in amount, are being passed. Rectal palpation and anal inspection are not sufficiently practised.

The bleeding may be due to purpura, scurvy, acute specific fevers and other blood conditions ; typhoid fever as well as dysentery ; cirrhosis or acute atrophy of liver or chronic lung and heart disease ; of course evidences of these affections may be found in other parts of the body ; their treatment is considered elsewhere. Oil of turpentine by mouth or rectum, ice bladders, or enemata of iced water and astringent enemata are the agencies ordinarily employed to check the bleeding.

## OBSTRUCTION OF THE BOWELS.—INTUSSUSCEPTION.

The bowels may be obstructed by simple constipation, fæcal accumulation, intussusception and peritonitis ; these are the commonest causes. Other occasional causes are congenital constrictions of intestines ; compression by

tumours; strangulation by bands, vermiform appendix or Meckel's diverticulum.

Most of the common causes of obstruction are considered elsewhere. Intussusception is not unfrequent under one year of age, but occurs at all ages. Male infants are more frequently affected than female. The commonest variety of intussusception is that in which the ileo-cæcal valve is and remains the most advanced point, the small intestine getting further and further into the colon which forms the outermost tube or sheath. Probably sudden paralysis of the caput cæcum coli, or relative inaction of it, as compared with colicky action of the ileum, is the proximate cause of the invagination. The looseness with which the colon is attached in the right iliac fossa, and the absence of a really distended and fixed caput cæcum coli during the first months of life, may have some share in the causation of intussusception.

The *symptoms* of intussusception are paroxysms of colic with screaming white face and hardness of the belly, often relievable by friction; vomiting more or less intense; more or less constipation; tenesmus with bloody and slimy evacuations; sausage-shaped or other shaped swelling generally on the left side of the belly. The bowel may be felt by careful examination of the rectum; in examining the rectum, simple prolapse of the bowel, which is often attended with evacuation of slime and blood, must be remembered. Some cases are **chronic** and last weeks, without causing anything more than attacks of griping, vomiting, constipation, and a little passage of slime and blood.

The *diagnosis* has to be made from (1) simple colic, which is impossible in the very early stage; from (2) typhlitis and peritonitis, which is not always easy; early pyrexia, tympanites and tenderness point rather to inflammation (typhlitic if in the right iliac fossa) than invagination, but when collapse

and a typhoid state have supervened the diagnosis may be impossible; from (3) dysenteric diarrhœa or dysentery, chiefly by the absence of tumour, the early fever and diarrhœa with blood and slime in the motions; from (4) fæcal impaction by the gradual history and careful examination of the rectum and abdomen—the fæcal masses are indentable and very different from the smooth, even outline of the tender invaginated intussusception; from (5) ordinary hernia by examination of its various localities. It is known, but not sufficiently recognized, that the symptoms of bowel obstruction are more largely due to strangulation of the vascular supply than to occlusion of the lumen of the intestine. Two chief forms of intussusception, the **acute** and the **chronic,** should be recognized; in the former vascular strangulation and bowel blocking are complete and sudden, the severity of the symptoms is great; in the latter the retardation of the circulation and the intestinal occlusion are neither rapid nor complete till the symptoms have lasted some time.

After the signs of intussusception have begun the bowel may turn out some fæcal matter which may come from the bowel beyond the occlusion, or in the more chronic form some may escape through the intussusceptum.

The **treatment** of intussusception is twofold—medical and surgical.

A sudden paroxysm of colic, with severe attendant screaming and whiteness of face, is not always a condition to be treated with purgatives. Such an occurrence should lead to a careful inspection of the abdomen—if possible during the convulsive seizure of the bowel and body, for then the path and termination of the peristalsis may be visible.

It may be impossible to detect the tumour of intussusception at the outset. If the paroxysm be of the severity described, the best treatment is the hot bath, at a temperature

of 100° F., followed by hot fomentations under oil silk and sprinkled freely with laudanum; a drop of laudanum may have to be given every few minutes to a child a few months old till the desired effect is produced; pain antagonises opium.

*Purgatives* for simple severe colic in infants ought *not* to be given at the very outset; not unless the case is certainly not one of intussusception. It is rare that the doctor sees the patient at the outset. If 24 hours have elapsed since the pain, vomiting and constipation have set in, inquiry should be made carefully for blood or slime in the stools, for the amount of both constituents may be very large or very small. A careful examination of the abdomen should be made for a tumour, if necessary, whilst the child is under the deep influence of chloroform.

If more than forty-eight hours have passed by without relief of the urgent symptoms, taxis, insufflation, injection and reposition are frequently lost causes; the question of abdominal section should be carefully considered.

A medical and a surgical path lie open; which course is to be pursued? If there be a doubt about the diagnosis as between peritonitis and intussusception, the antiseptic surgeon may be called in. It is certain that the little infants cannot stand much rectal insufflation or injection, their vitality is low, the intussusception often severe, and the collapse of the worst degree. For the same reasons the operation should be performed as rapidly as possible, and the collapse must not be increased by too much spray or too much carbolic acid. The infant should be kept under the influence of opium, and purgatives never thought of.

The limit for *mechanical treatment* may be placed at forty-eight hours, because after that adhesions may possibly prevent proper reposition by mechanical means, and because such means would increase collapse. The *great point is to prevent*

*collapse or loss of vital power;* hence the necessity for stimulants, and for the avoidance of pain, which greatly reduces vitality. The diet in all cases of intussusception should be carried out on the small and frequent cold dose principle; it should be always fluid, such as will yield no residue and be absorbed from the stomach and duodenum. Iced water or ice, iced or cold whey, cold thin barley water, cold thin beef tea are the kinds of things to order, but this liquidation must not be overdone especially not if perforative peritonitis is a possible diagnosis. Some authors—Goodhart and others—advise delaying abdominal section even in the acute infantile cases.

What is the *latest date* from the onset of symptoms at which abdominal section may be performed? It is difficult to give a good answer to this question, but perhaps six days should be the limit. Extreme collapse and marked typhoid state preclude an operation which must necessarily be attended with a certain amount of shock and loss of vitality.

Occasionally nature cures the intussusception by sloughing off the intussuscepted layers; this is attended with the sudden passage of a copious offensive stool and the formation of adhesions between the serous surfaces; the sloughing usually happens after one week has gone by. The necessity for opium and perfect rest must be insisted on; the diet should be of the least possible quantity and of the most digestible quality; any excess of farinaceous or saccharine articles will be sure to be attended with fermentation and flatulence, which may lead to bursting of the lightly adherent intestines; potatoes, peas, beans, rice, tapioca, sago, and jams should be prohibited; it would be well to use predigested food, as the necessary continuance of the exhibition of opium prevents the digestive organs from acting efficiently. Sloughing off of the intussusceptum, perhaps never occurs in infants, but only in older children. The symptoms, as so often

happens in infantile pathology, are far more severe and acute the younger is the child.

As to the *prevention* of intussusception, the necessity for careful management of the *diet* is only too evident, for it is probable that slight intussusceptions are frequent during attacks of colic, such, I imagine, as may recover spontaneously; therefore the guardians of the infant cannot attend too strictly to the principles and practice of feeding as laid down elsewhere. Excess of carbonic acid in the blood promotes peristalsis, therefore the atmosphere of the room should be pure, and every care taken to let the infant have fresh and cool air; attention to all other hygienic matters is certainly preventive of intussusceptions.

Being less severe and more chronic, many of the cases in older children subside under the employment of opium; belladonna is a most valuable adjunct; tinct. of belladonna ℥x. and tinct. of opium ℥iii. every four or six hours is an ordinary dose for a child five years old; hot belladonna and opium fomentations may be used also.

*Taxis* must be performed with the greatest gentleness under the influence of chloroform; the belly wall should be lax, the surgeon should so manipulate the fingers of the two hands as to try to undo the invagination in the inverse order in which it was made by the peristaltic action.

*Insufflation of air* has been occasionally successful; a small pair of bellows may be used and fitted with a gum elastic catheter by means of a piece of india-rubber tubing; the child should be in a state of anæsthesia, the buttocks raised on a pillow, and patient lying on the back or left side. Care should be taken to prevent the escape of air by keeping the anus closely pressed against the catheter; the nozzle of the bellows has been placed directly within the anus. The air should be equably and gradually injected in good quantity; there is danger of rupture of the bowel by over-distension. When the procedure is proving successful the tumour may be felt to be disappearing along the course of the colon, and the final reduction is sometimes attended with an audible sound. The injection of warm water, oil, or warm gruel, may be made with a

Higginson's syringe, the fluid being slowly, equably, and gradually, but forcibly injected, and the anus kept closed by lateral pressure of its sides against the tubes; the reduction of the invagination may be announced by the passage of a copious stool.

The rectal tube may be connected with an improvised water-cistern or Maw's irrigator placed high above the bed, and thus may be obtained a more equable and forcible distension; careful control should be exercised lest too much force rupture the bowel.

The *œsophageal bougie* guarded with a sponge has been employed also in the reposition of the invagination. It could hardly be possible to completely replace an invagination by such means; Dr. Nissen says that he has cured two cases by its means; perhaps partial return is effected, and nature may do the rest under the influence of arrested peristalsis by opium; these procedures require considerable caution. Whilst they are being employed taxis may be judiciously practised with any of them.

It is not my province here to go into the methods of performing antiseptic abdominal surgery.

## WORMS.

Worms are common in children; symptoms ascribed to them are frequently due to gastro-enteric catarrh; much mucus is a favourable nidus for their growth and development; they may not give rise to symptoms; but weakly neurotic children may suffer much from their presence.

If the reader will imagine any symptom referable to the nervous or any other system worms may cause that symptom. Children who have worms are often debilitated, pale and thin. Thread worms may go with dysenteric diarrhœa, tenesmus, prolapse of bowel and leucorrhœa; remember that their irritation may lead to masturbation in boys and girls.

## TAPE WORMS.

**Tænia solium** is the adult state of the cysticercus cellulosus found in measly pork; its head has a snout or rostellum with a double circlet of curved silicious hooklets and four suckers behind. **Tænia mediocanellata** is the adult state of the cysticercus mediocanellata found in beef; its head has neither snout nor hooklets, but four large suckers; the sexual organs are more ramified than those in the proglottides of t.

solium. **Bothriocephalus latus** is believed to be the adult state of a cysticercus found in fish, whelks, mussels, and oysters; the head has no hooks or snout, but two long lateral grooves or suckers; the segments are broader than long.

## ROUND WORMS.

**Ascaris Lumbricoides** is in shape and size nearly like the common garden worm; their numbers vary from one to a great many; there are males and females; the former are shorter and curved behind where the sexual apparatus exists; the latter are straighter and thicker behind than the males; the vagina is situate at the junction of the first and second thirds of the body; they reside in the small intestines, whence they may wander into the bile duct and cause jaundice, or into the stomach, gullet, mouth, nose, larynx, peritoneum, vagina or urinary tracts.

## THREAD WORMS.

**Oxyuris vermicularis** is very narrow and short; the males about one or two lines in length; the females about five lines; the head has a mouth and three slightly marked lips; there is a fin-like vertical membrane above and below; the male is curved behind where the sexual apparatus exists; the female is straighter, and has the vagina at the junction of the first and second thirds of the body (compare with Ascaris); their chief residence is the cæcum, whence they migrate to the rectum in large numbers; they are often found about the anus, vagina, under the prepuce. The only satisfactory diagnosis of worms is seeing them in the stools; the stools should always be inspected by the doctor; the naked eye may reveal segments of tape worm, round worms, and thread worms; the microscope may enable distinctions to be drawn between the different kinds of tape worms, and to recognize the ova of the different kinds of worms.

## OVA.

The mature eggs of *ascaris lumbricoides* are oval, have a double chitinous and brownish coat with radiate markings, and are about $\frac{1}{300}$ in. in diameter; the ova of the *thread worm* are $\frac{1}{500}$ in. in length, flattened on one side and convex or rounded elsewhere; the ova of tænia solium are spherical, $\frac{1}{750}$ in. in diameter, and have a thick striated shell; the eggs of *t. mediocanellata* are oval, and larger than those of t. solium; the egg of b. latus is oval, brown coloured, and has a thin shell, which opens at one end by a well-defined lid or operculum. The

**trichocephalus dispar** causes no symptoms; it is like a piece of thread, and one to two inches long; the hind part is thick, the front hair-like; the male is smaller and spirally curved behind; the ova are oval, brown, and have a boss at either end.

It must not be forgotten that particles and articles may be found in the stools and urine and be mistaken for worms when they are nothing more than extraneous objects, the residue of the food or else of substances accidentally or intentionally introduced into the dejecta. When there is excess of curd or oil in the intestines objects looking like hard soap and gall stones may be seen in the stools.

**Treatment.**—Worms, as a rule, like thrush, are epiphenomena. *The first thing is to treat the disorder of the gastro-enteric membrane* (see Indigestion, Diarrhœa, &c.). It is absurd to give anthelmintics unless worms are known to be present.

**Anthelmintics for the tape worm.**—The anthelmintic should only be given when the bowels have been thoroughly emptied by fasting and a purgative; the child should have nothing but weak milk and barley water or broth all day, and a teaspoonful of castor oil at night. Next morning after the bowels have acted freely (say 7 a.m.) the following draught should be given:—

℞ Liq. Ext. of Male Fern, ♏xxx.
Mucilag. Trag., ʒi.
Glycerini, ʒss.
Aq. Chlorof., ℥ss.

for a child five years old.

A small dose of castor oil may be given three hours later if the bowels have not acted. The fast should be continued on broth without solids till eleven o'clock.

The head of the worm must be assiduously looked for, each stool being kept and carefully examined by freely diluting it, and pouring the mass in small portions on to a large wide flat dish, and microscoping doubtful objects; I have seen the head at least six times.

I do not advise small frequent doses ℥v. of the oil of male fern. Thirty to sixty grains of the powdered rhizome of the fern have been used instead of the liquid extract; the liquid extract may be given in capsules containing fifteen minims in each; children readily swallow these if they are dropped into the throat with the head thrown back.

A quarter of an ounce of *Cusso*, the flowers and tops of an Abyssinian plant, has been employed; a teaspoonful of castor oil should be given two hours after it.

The orange red powder *Kamala* may be employed as a single dram dose suspended in mucilage, gruel, syrup, or treacle; castor oil may follow it in two hours, but is usually unnecessary; oil of *turpentine* one dram in honey or mucilage, or in capsules, should also be followed by castor oil.

*Petroleum*, in a dose of fifteen minims, may be given with gruel and followed by a purge. *Decoctum granati* ℥i. of the British Pharmacopœia is sometimes effective; it is astringent, and requires a simple purge after it. Half-an-ounce of powdered nut of *areca* may be given, and it needs a purge to follow, as it is astringent. *Cowhage*, the hairs of the West Indian fruit mucuna pruriens, acts mechanically; it is given in teaspoonful doses as an electuary, made with syrup or honey or treacle, and followed in a couple of hours by a dram of castor oil or compound liquorice powder. *Pelletierine*, an alkaloid, has been used to expel tænia. A large teaspoonful of Tonnet's pelletierine solution was prescribed; it contained about six centigrammes (nearly a grain) of the alkaloid; the child was thirty-two months old. A purgative should follow. *Naphthalin* has been given internally in two-grain doses twice or thrice a day for tænia and ascarides. All the above doses are given as for a child six years old. Tæniæ are rare below this age.

*Hygiene.*—When the worm has been expelled or before, hygienic measures should be taken, if the child be weak, to remove any catarrhal state by attention to the diet, especially by avoiding excess of sweets, cakes, pastry, and starchy foods; wrapping the belly and thighs up in woollen garments, cold douches, and by exercise. Give children sufficient salt with their food. The administration of iron and cod-liver oil should be carried out as recommended for scrofula. The exsiccated sulphate of iron is very useful, in three-grain doses, prescribed with glycerine, in relaxed states of the

mucous membrane with excessive discharge of mucus; common salt and ammonium chloride are useful for the same purpose; they may be most effectually applied by employing the irrigator.

**Round worms.**—In the treatment of round worms the same attention to the hygiene of the body and bowels is necessary. Santonin powder is the chief remedy. Fasting on a liquid diet is desirable, and the bowels should be emptied by a watery purge before the santonin is given. Two grains of santonin may be laid on the back of the tongue and washed down with sugar and water every other night; it often causes vomiting and nervous symptoms, even yellow vision. The urine, if alkaline, has a bright red colour, which has been mistaken for blood. The santonin may be given in syrup, or glycerine, or lozenges; gingerbread should be forbidden to children. The administration of it in castor oil has been recommended; two grains should be dissolved in half-an-ounce of castor oil, and ʒi. given three times a day. I have tried this; it has often failed; a single large dose is the best, even though it may cause vomiting. It may keep down if given on an empty stomach with iced water.

Spigelia is a favourite with some in America. Louis Starr recommends:—Santonini, gr. iv. Ext. Spigeliæ et Sennæ Fl., ℥iss. Syrupi, ℥ss. Simple Elixir to ℥iii. ʒii. t.d.s.

Five drops of the volatile oil of Chenopodium may be given on sugar three times a day; a dose of castor oil will be needed every night for two or three nights.

Sometimes a dose of calomel gr. i., and Pulv. Scammon. or Jalapæ Co. gr. x., will remove round worms; cowhage and powdered tin have been given in teaspoonful doses, followed by a purge; sulphite of soda gr. x. three times a day, with glyc. ♏xx. and chloroform water, is said to be efficacious if combined with a purge of castor oil ʒi. or decoction of aloes ℥ss.

**Thread worms,** more than other varieties, are associated with chronic catarrh of the lower bowel; therefore the diet,

clothing, exercise, cod-liver oil and iron as described above are even more necessary in getting rid of them. The best recommendations are: a meat and broth diet for four days, plenty of salt in this food; a diabetic diet for a week; irrigation every morning of salt water one per cent. (see above); flannel lined with cotton wool over belly, buttocks and legs. Injections are the usual method of killing these worms. The vaginal and subpreputial spaces should be examined, and if necessary cleaned.

Any substance which coagulates albumen may be injected; each injection should be not more than two ounces; they should be repeated twice or thrice a day. Common salt a dram to the half-pint, infusion of quassia, tincture of steel, 3i. to the pint of water, solution of castile soap gr. xxx. to Oi., lime water or solution of alum 3i. to Oi. Santonin may be given.

An enema of starch and tincture of opium ♏v. to ℥i. may be used to relieve intense distress; cold compresses are good; some use hot poultices of starch; these applications may be repeated according to circumstances.

It may be necessary to cure the catarrh before giving special remedies; chloride of ammonium has a reputation:—

℞ Ammonii Chloridi, 3ii.
Inf. Sennæ, 3iv.
Inf. Gent., Co., ad ℥iii. 3i.

before each meal.

It is most important to keep the bottom clean and dry. Oiling, after thorough drying, is better than dusting with powder to prevent excoriation.

**Pruritus Ani.**—The anal irritation may be overcome by any mercurial ointment; blue or white, diluted four times, may answer, or a lotion of belladonna tincture ℥i. and dilute prussic acid 3ss., Aq. ℥ii. Eczema, or soreness of this nature attending the pruritus, should be treated by removing all scabs, not using water, but sweet oil, and anointing with a mild mercurial ointment, say very dilute white precipitate, or if this prove too irritant, ung. diachyli.

℞ Cocaine, 1 part.
Bismuth Subnit., 2 parts.
Lanoline, 20 parts (E. Wende), is also advised.

The parts must be cleaned with oil frequently. Ointment should only

be applied on lint (with a perforation) when the bare surface of the sore is exposed by thorough cleansing. If there be a *fissure* of the anus and the above measures be insufficient to effect a cure, forcible distension of the anus may be practised, the child being placed under the influence of chloroform. The well-greased forefinger, or this and the second finger of the practitioner may be used. Extract of belladonna or the ointment of galls and opium may be employed to relieve pain. A dram of bromide of potassium in four of glycerine has also been recommended. Constipation may result from these sores and fissures; the motions should be kept soft or liquid. (See Constipation.)

The *preventive* treatment of worms consists in attention to the general measures to which frequent allusion has been made. Raw meat, especially beef, is a source of tænia; mutton is preferable when raw meat is prescribed. The ova of thread worms are often conveyed to the mouth by children; hence the necessity for constant cleanliness of the bottom and hands, and for the relief of anal irritation. Impure water is a source of worms; do not allow children, especially those living in marshy places, to drink well or stream water; water for children as for adults should be boiled and filtered.

*Diet.*—Relaxing and fermenting food should be avoided, especially milk preparations, fruits, fatty and farinaceous substances. Boiled and roast meats, wine and bitters may be ordered as tonic and invigorating. A mere change of diet sometimes cures the cases. Broths and soups may be ordered instead of milk and fruits. Gluten bread may be substituted as containing less farinaceous food. Boiled and filtered water is the best drink.

### PROLAPSE OF RECTUM.—"PROLAPSUS ANI."

Prolapse may be due to hooping cough or other severe coughing and straining; screaming in weakly children, especially when constipation is associated with pain from whatever cause (see Chap. II.); tenesmus and diarrhœa;

ascarides ; rectal polypi ; stone in the bladder, phimosis and other diseases of the urinary tract. Bearing these causes in mind treatment is not difficult.

*Posture.*—In defæcating the child should lie on its right side, and the stool be received into a diaper ; the anus should be supported by pressing together the buttocks, or better, by placing the thumb and forefinger lengthwise so as to support the anal margins during the passage of the motion. The **treatment** for constipation and diarrhœa should be instituted, and any fissures or sores healed by cleansing, and if necessary the application of the solid stick of nitrate of silver ; it may be requisite to incise the fissure. *Forcible dilatation* of the anal sphincter is occasionally practised with advantage.

*Enemata* often cause screaming in young children during their administration, and the bowel will infallibly descend ; in constipation it often happens that if the purge acts whilst the child is asleep the bowel does not prolapse.

*Astringent injections* in my experience are rarely required. Alum or sulphate of iron, five grains to the ounce of water, iced water or infusion of rhatany are suitable.

Prolapse due to acute and chronic diarrhœa is frequently relieved by the astringents recommended for those diseases : catechu, kino, red gum, rhatany and logwood may be used as injections also.

The prolapse should be returned by pouring over it a jug of cold water, then pressing it up firmly and gently with a clean aseptic, soft, well oiled rag, placed over the end of the repositing finger, which is inserted into the orifice of the protrusion. If there is tenesmus, a suppository of opium containing gr. $\frac{1}{8}$ may be inserted, or five drops of laudanum in starch may be injected ; hot fomentations to the groin and bottom are also useful.

When *chronic catarrh* is the cause of the repeated diarrhœa and prolapse, remember the abdominal woollen binder. Pro-

lapse may occur without the action of the bowels. As the result of alterations of the submucous tissue and of palsy of the sphincter; it should be treated by strapping the buttocks together with a broad layer of strapping plaister, and by the internal administration of strychnia and iron. Attention must be paid to diet, hygiene and clothing. Some cases resist all treatment, the infant may become marasmic and die; this would probably never happen if the case were seen early enough.

℞ Liq. Strych., ♏ii.
Tinct. Ferri Perch., ♏ii.
Glyc., ♏xx.
Aq., ʒii. t.d.s.

for a child of five.

## ACUTE PERITONITIS.

Peritonitis has the same symptoms, causes, terminations and treatment in the old and young. In infants, as in collapsed individuals, it is more frequently latent or the symptoms are not marked, absence of nervous energy prevents active manifestations of health and disease. In foundling hospitals serofibrinous peritonitis has occurred in epidemics, sometimes with pleurisy and pericarditis or preceded by erysipelas and suppurative umbilical phlebitis. Syphilis has caused intra-uterine peritonitis and peritonitis in infancy, other signs of syphilis being present. I believe that sewer gas and septic agencies can cause peritonitis in infancy and childhood; I have seen all the serous cavities containing serofibrinous exudation, without obvious cause except that the drains in the house were being repaired. Perforation of the cæcum and appendix is a frequent cause in children some years old; though this form of peritonitis is not common. Typhoid fever has caused perforative peritonitis in children. Tuberculosis may be associated with

serofibrinous acute peritonitis. Scarlatina may cause peritonitis, often purulent; the symptoms may be ill defined. Peritonitis may be secondary to pleurisy or pericarditis. Sometimes the stomach perforates with resulting peritonitis which may be localized or circumscribed—as after puncture of hydatid cysts or perforation of the cæcum.

The *symptoms* may be latent; one or more of the typical signs may be suppressed; *tenderness* may be absent; spontaneous pains referred to the umbilicus, and sometimes of colicky character, are generally present at the outset. *Tympanites*, local or general, is rarely wanting; the pulse need not be small and wiry, often is not; *vomiting* is not constant; it may be absent from first to last; obstinate constipation is the rule; a certain amount of ascites is common. Peritonitis paralyses the diaphragm, belly walls and bowels by direct action; indirectly it tends to paralyse the circulation, respiration and nervous action.

**Treatment.**—Absolute rest in bed; opium internally; counter-irritation and hot moist applications externally; unload the bowel by small enemata; fluid digestible diet and stimulants—are the chief items of medical treatment.

The *posture* in bed should be on the back, the legs raised by means of pillows under the knees, and the head and chest inclined by the same means so as to relax all tension. A cradle should be stretched over the trunk to keep off the weight of the clothes. Noise and disturbance cause contractions of the abdomen and increase the mental distress. Darkness is generally agreeable to the child. If possible the room should be so situated as to be free from the jarring of passing vehicles.

A twelfth of a grain of opium powder or drop doses of tincture of *opium* may be given till slight drowsiness and sufficient effect over the pains have been produced. Vomiting may be obstinate; it should be abated by small frequent

doses of soda water, iced water or ice with ten drops of brandy; the opium tends to check it; a $\frac{1}{1\frac{1}{2}}$ grain of morphia may be injected under the skin of the arm or abdomen in a child five years old.

*Fomentations* sprinkled with a dram of laudanum, covered with oil silk and a layer of cotton wool, may be used; or the flannels may be sprinkled with a couple of drams of turpentine. Some employ cold wet *compresses* well rung out and frequently changed—as in tonsillitis and pleurisy. *Light poultices* of linseed meal often appear to give more relief than other applications, and a little mustard, one part to eight of linseed, may prove an effectual counter-irritant if left on about fifteen minutes. A layer of muslin should protect the skin. Do not give more liquid than can be helped.

Leeches should not be employed on any account in general peritonitis. In perforation the collapse is too great and should not be further added to by depletion; in scarlatinal peritonitis leeching would be absurd, for the patients are generally sufficiently reduced already, and in the septic cases loss of blood ought not to be encouraged.

*Tympanites* may be relieved by terebene or turpentine in five-minim doses in capsules, or with chloroform water and mucilage or honey, or better, by an enema containing a dram of oil of turpentine. A catheter or long tube passed into the descending colon from the anus and gentle friction or massage of the abdomen, has been recommended, but I condemn this practice as futile in effect and injurious to the peritoneum.

*Collapse* may be combatted by the same stimulant treatment, and by such treatment as is indicated under acute diarrhœa.

The *diet* should consist of as much fluid food as can be digested; raw meat, milk, and gruel may be predigested by Benger's liquors or by pancreatic powders; strong beef tea, milk and barley water, mutton broth, raw new laid eggs beaten up with water and brandy, the various liquid meat essences, veal broth, chicken tea, and the like—may be used in small frequent doses. Brandy may be given in the food in half-dram doses every two hours, or as the pulse and general aspect may indicate.

Iced champagne is very good; old whisky is preferred by some. In *perforative peritonitis*, at least, and in the other forms where the pleura and pericardium are not involved, and suppuration has occurred, I should strongly advise abdominal section by a careful and "antiseptic" surgeon. The peritoneum should be laid freely open, and a most abundant and careful cleansing practised with weak Condy's fluid and water, finishing up with carbolic acid 1 in 100.

## TYPHLITIS AND PERITYPHLITIS.

These inflammations mostly result from *mechanical irritation* of the cæcum or appendix vermiformis by concretions or foreign bodies; constipation causes distension of the large bowel, and this tells most on the cul-de-sac, cæcum. Inflammation and ulceration may spread from the mucous membrane of the cæcum to the sub-peritoneal connective tissue, or to the peritoneum. The disease is generally originated in the vermiform appendix. Sudden pain and tenderness in the right iliac fossa, with flexion of the thigh on the belly and halting gait, may be the initial symptoms; the pain may not be referred to the cæcum; it may be umbilical, or general, or referred to the left iliac fossa; the tenderness may be more diffused. Vomiting may be frequent, but never stercoraceous in character. Constipation may be absolute; scybala and mucous stools may be passed; hardened masses and gurgling may be felt in the right iliac fossa. Œdema of the skin, a patch of redness, and induration may be noted locally; fever is almost always present. The resulting abscess may open in any direction outwards or into the bowel. Perforative peritonitis is characterised by a sudden severe onset, and more or less collapse. Typhlitis is prone to remissions and recurrence. Simple typhlitis without suppuration in the connective tissue may last only a few days, and recovery is pretty general. *Impaction of fæces* in a distended cæcum may cause pain, some tenderness, constipation and rarely vomiting; but in genuine typhlitis the pain is of sudden

onset and attended with fever. Intussusception may at the outset be diagnosed from typhlitis by the absence of initial inflammation and fever. The tumour of typhlitis is situate in the right iliac fossa. In intussusception bloody and slimy dejecta with tenesmus are almost constant symptoms, and the tumour, if felt, is usually in the left side of the belly. A sudden severe onset, with death in two days, is most likely due to free perforation of the appendix.

**Treatment.**—The child must be in bed with the right thigh flexed and supported by a pillow. If the local symptoms are moderate the skin in the groin should be fomented with hot water, dried and painted thoroughly with glycerine of belladonna (equal parts of the extract, glycerine, and water); hot fomentations under oil silk may be changed frequently, if this does not cause pain. If the patient be robust and the local symptoms severe two leeches may be applied over the inflamed part. Morphia may be given under the skin (gr. $_1\frac{1}{2}$) for a child of five, instead of opium by the mouth. Opium and belladonna should be given internally. Five drops of tincture of belladonna and two drops of tincture of opium may be given every hour for three hours, and then at intervals of six hours to a child seven years old.

After the three doses of opium and belladonna the rectum should be emptied by a five-ounce enema of warm soap and water. Purgatives must not be given. Vomiting, seldom troublesome, may be checked by iced water or ice. Restlessness and fever may be abated by the ice bag. The diet must be low and fluid. Milk should not be given pure; it must be guarded by barley water. Weak beef tea, mutton broth, raw meat juice may be allowed. Any gruel of arrowroot or other farinaceous or saccharine articles should be limited in amount, so as to avoid a residue and prevent flatulence. The patient should drink water freely in simple typhlitis; have great faith in the free drinking of water in this complaint;

there is but little fear that digestion will be seriously impaired thereby.

Perforation or persistence of symptoms should be met by increasing the stimulants; nothing is so good as sound brandy, but ammoniated tincture of quinine, in half-dram doses, with glycerine and water, is an excellent tonic. An effervescing draught of citric acid and carbonate of ammonia is in use. Sal volatile half-a-dram, fluid extract of cinchona three minims, with glycerine and water may be ordered three times a day. The diet must be digestible or predigested in these cases. Assiduous fomentation or poulticing should be the treatment of suppuration unless the employment of the knife is advocated. Summon without delay a *careful* and "*antiseptic*" surgeon, and let the belly be opened in the middle line if there be strong evidence of perforation. An induration, œdematous skin and a red mark thereon are signs for using the knife, free and thorough aseptic irrigation, drainings and dressings; nowadaws almost anything can be rendered aseptic, perhaps even the cæcum itself. The *exploring needle* may be used to diagnose pus and its situation. The fœtor of the pus may be soon reduced by free drainage and the use of antiseptics about the wound; iodoform is best; the dressing should be of sal alembroth, and a pad of salicylic or iodoform wool over this.

Difference of opinion exists about the *syringing of such cavities;* I have never seen any harm come of it yet; Goodhart advises not to interfere with the walls of the cavity. If by this is meant not probing or manipulating to get out the pus one must agree. But gently syringing with weak antiseptic fluids appears to be free from the objection which obtains to washing out the pleura, for the cavity resulting from typhlitis may have irregular walls, but is seldom very large, and, moreover, is surrounded by the softer belly wall and intestines.

The principles of **treatment** of typhlitis then are the prevention of irritation from within, and from without by rest, belladonna, and opium, and the avoidance of purges that act on the muscular coat, and of food that causes flatulent distension. Free drinking when there is simple typhlitis tends to soften fæcal accumulations.

No authors advise strong purgatives, but some see no harm in the administration of saline purgatives whilst the peristalsis is paralysed by the free use of opium. Sulphate of soda (3ss.) and comp. extract of colocynth (gr. ii.) may then be given frequently with opium (gr. $\frac{1}{8}$) for a

child five years old. I think free drinking would accomplish the same purpose.

*Large enemata* are also advised by some; all parts of the intestine sympathise with one another; the peristalsis evoked by a large enema may be accompanied by a tendency to violent action of the neighbourhood of the cæcum, which might be dangerous in some cases. The enema should be used simply to empty what is in the rectum and sigmoid flexure.

*Mercury* should never be employed at any stage. It is recommended by some to start the treatment with a calomel or blue pill; it might promote absorption of adhesions which is scarcely desirable; adhesions are not likely to be formed unless there be a natural necessity for them.

**Preventive treatment** of recurrence should be carried out by attention to the diet; daily exercise; diurnal evacuation of the bowels, and other measures which regulate the peristalsis and the general health; tonics of quinine and nux vomica or strychnia; massage, especially of the belly, along the colon in the direction of peristalsis; and a cold douche every morning.

## TUBERCULAR ABDOMINAL DISEASE; TUBERCULAR ULCERATION OF BOWEL, DISEASE OF GLANDS AND PERITONITIS.

All these conditions may coexist, or any two of them may be associated, or each may occur by itself alone.

*Ulceration of bowel* is very difficult to diagnose with certainty, since it has no pathognomonic signs. The frequent passage of dark clots of blood, tarry or sooty matter and shreds of membrane or exudation, with variable diarrhœa of remarkably changing characters, are the best indications of its occurrence. It is difficult to diagnose with certainty the tubercular enlargement of mesenteric glands (Tabes Mesenterica), what is taken to be a gland may be a plaque of tubercular infiltration or fæcal matter.

The pathognomonic signs of chronic or tubercular peritonitis are indurations and abscesses.

The symptomatology, course, and termination of all three

diseases present many points in common. The *onset* in all is usually gradual, but sometimes sudden; the course in all is usually interrupted and remittent rather than continuous and definitely terminating; the termination in all may be recovery or death; the duration is measured by weeks and months.

*Recovery* from tubercular peritonitis is not uncommon, from ulceration probably rare, from true tabes occasional. The recovery, however, is usually imperfect in all; the child remains weak in some way—either debilitated, anæmic, or thin. Occasionally the health becomes as good as it was before the illness. The first symptom of these diseases varies as much as does the combination of symptoms met with in them. Tenderness, colicky pains and enlargement of the belly are common local symptoms, and emaciation, anæmia, debility and low spirits are common general symptoms. Loss of appetite, thirst, vomiting and fever may or may not be present, but are usually met with at some period or other in the course of these diseases. The belly swelling is usually due to tympanites (gaseous distension).

In peritonitis, and perhaps tabes, there may be water-ascites. Both tympanites and ascites may be slight, moderate, and occasionally excessive.

The bowels may be shut for days together, even if ulceration exists; on the other hand, there may be profuse diarrhœa. Rarely the chronic form of peritonitis starts suddenly with cholera-like intensity, diarrhœa, vomiting, collapse, algidity and tympanites. Diarrhœa, occasional or even more continual, is no proof by itself of the coexistence of intestinal ulceration (Gee). I can corroborate this from my own experience in the post-mortem room. Recurring attacks of diarrhœa and recurring attacks of constipation, or even complete obstruction, are frequently observed in ulceration and peritonitis.

"The indurations of chronic peritonitis may have the form of bands and patches or of lumps and knots. They are certainly present in most cases at some period or other of the disease. They begin to appear within a few weeks of the onset of the illness. They are more or less obscured by the coexisting tympanites, and for this, or some other reason, they are not felt equally well at all times in the same patient. When the abdomen is very tender or resisting, I usually administer chloroform to the child before proceeding to the examination, and I strongly advise you to do the same in a doubtful case. The bands are commonly transverse, stretching right across the belly, or confined to one side of it. They are felt above the navel, on a level with the navel, or below it —for instance, parallel to Poupart's ligament. They are sometimes remarkably hard. They are mostly about the breadth of a finger, or more. The *patches* of induration, like the bands, may be met with anywhere. The lumps and knots are sometimes very numerous; sometimes there are only one or two. Their size is very different, they often feel like nuts or pips. They differ very much in situation; there is no rule in these matters. The distinction (not always possible) between peritoneal and glandular lumps is to be found in the fact that the former are, as a rule, more superficial, less deeply seated than the latter.

"Suppuration—discharge of pus from the navel, due to a local peritoneal abscess—is likewise characteristic. Sometimes there is nothing more than an appearance of pointing, which afterwards subsides, and never goes on to discharge. The navel looks red and swollen, not merely protruded, but its tissues swollen (caput medusæ). This sign I believe to be no less characteristic. The pus is sometimes mixed with fæces. This is a condition which indicates ulceration of the intestine, and is a very much more dangerous affair than the discharge of pus alone" (Gee). Every word of this realistic

description I can confirm from personal observation. A shiny, tense belly, with large blue superficial veins and swelling of some inguinal glands, may occur without much ascites. Sometimes a doughy feeling of the belly with but slight resistance to palpation, and without local indurations, are the only physical signs.

The **treatment** of tubercular ulceration of the bowels should be conducted on the lines laid down at p. 322 for chronic ulcerative diarrhœa.

*Absolute rest and immobility of the body and belly of the patient; perfect uniform woollen clothing of belly and body; treatment of symptoms; regulation of regimen.*

The child—usually in the second period of dentition—must be confined day and night to bed. Care should be taken that the room is thoroughly ventilated without the child being exposed to draughts. The instant disinfection and removal of stools and of all soiled bed and body linen is necessary. The bedding must be kept sweet and clean; it is well to have two beds and two rooms; in changing the patient, the belly must not be jolted; any movement or disturbance of the abdomen may give pain, and may increase the mischief; the abdomen should be kept uniformly warm by a layer of cotton wadding, and a flannel bandage in one layer, fastening behind with buttons; it should reach up to the ribs and down over the hips, and may be kept in position by shoulder straps and perineal bands. Pain of colicky sort may be relieved by hot applications, by opium and attention to diet. The application may be light linseed meal poultices, hot fomentations with laudanum thereon, spongiopiline, a flannel bag full of camomile flowers or light bran; it should not weigh heavily on the abdomen.

If there is œdema and great tenderness with signs of pointing, glycerine and belladonna paint may be freely used

with hot and moist fomentations. If there is an actual discharging abscess, hot and moist boracic acid lint fomentations are better than poultices; iodoform and salicylic wool are very valuable as absorbent antiseptics; picked oakum and marine tow are cheaper.

*Vomiting* and *thirst* may be relieved by small doses of iced drinks; *tympanites* by a proper dietary and by injections of oil of turpentine ʒss., in warm thin starch ℥ss.

*Ascites* rarely requires paracentesis; if it be the chief symptom, diuretics may be ordered, and the amount of drink restricted. Firmly strapping the belly with strips of diachylon plaister is, I am convinced, excellent treatment, not only for ascites, but in these diseases generally. Resin of copaiva in three-grain doses for a child of seven may be prescribed in Mist. Amygdal. Co., and its effects carefully watched; in some cases it effected wonders; in other cases the vomiting and diarrhœa were increased, and the appetite became worse.

The local *indurations* may be treated by infriction into the skin over them of soap liniment, olive oil or neat's-foot oil, or by painting the skin once a day with five per cent. oleate of mercury.

*Constipation* should not be overcome by strong purges; the rectum should be evacuated by a warm enema of about five ounces of thin starch or soap and water, with a dram of castor oil or turpentine; occasional doses of rhubarb and soda gr. x., or compound liquorice powder ʒss. to ʒi., may be given.

The *diarrhœa* in ulceration is often most troublesome to stanch; general and local sedatives may be used; opium should always be given by the mouth or rectum; ten drops of laudanum may be repeated if necessary.

*Local sedatives.*—Bismuth trisnitrate is perhaps the most useful of all drugs; it should be given in large doses; a child of seven may take twenty grains three or four times a day in a half-dram of mucilage of acacia or tragacanth, with two drops of laudanum and a tablespoonful of chloroform water. Many *astringents* may be tried if this fail.

℞ Extract of Logwood, gr. v.
Tincture of Opium, ♏ii.
Ipecacuanha Wine, ♏ v.
Chalk Mixture to ʒiii. t.d.s.

℞ Liq. Ext. of Red Gum, ♏x.
Glycerine, ♏x.
Spt. of Chlorof., ♏v.
Peppermint Water to ℥ii. t.d.s.

℞ Diluted Nitric Acid, ♏ii.
Comp. Tinct. of Camph., ♏v.
Decoction of Logwood to ℥ii. t.d.s.

℞ Extract of Rhatany, gr. v.
Extract of Logwood, gr. iii.
Chalk Mixture to ℥iii. t.d.s.

These for children seven years old. (For further treatment, see the several articles on Diarrhœa.)

Small doses of mercury and chalk (gr. $\frac{1}{4}$) with or without Dover's powder (gr. $\frac{1}{2}$) may be used to check diarrhœa: or the liquor hydrargyri perchloridi. Sometimes mercurials are prescribed in tubercular disease; the inunction of mercurial ointments, liniments, and simple oil may be practised in the absence of much tenderness to promote the absorption of the infiltration which glues the coils of gut together.

*Leeches* are seldom used now as local depletives for the pain of tubercular peritonitis. Heat and dryness of the *skin* may be assuaged by sponging the surface with tepid water; the skin should be cleaned regularly with soap and water every day in all cases.

The *diet* should be of the most digestible description; the quantity should be regulated by the powers of digestion and absorption; the stools and the state of the stomach as shown in the absence of pain, acidity, and flatulence, are the guides. Cow's milk may not be digested; it should be given diluted with as much barley water, isinglass or gelatine, as will suffice to prevent the formation of large lumps of hard curd. Skimmed milk, or boiled and strained milk, may be better borne; the milk may be predigested by Benger's liquor pancreaticus; or whey may be given. Raw meat, meat jelly, raw white or raw yolk of egg, raw meat juice, and the various liquid meat juices in the market afford a sufficient number of chiefly proteid aliments. Cream or bacon fat as hydrocarbons may be given, according to the state of digestion. Cod-liver oil should be given in minute doses if it do not create nausea, diarrhœa, or other objectionable symptoms. *Fats* may be rubbed into the groin, belly and axillæ; cod-liver oil inunction is not nice. As to *carbohydrates*, nothing is better than Mellin's food as a rule; it rarely

disturbs the bowels; if the digestion be fair, other starchy matters may be used, but the quantity of potato, rice, tapioca, sago, and the like must be very small; the starch capsules must be burst by thoroughly boiling. Jams, most vegetables and sweets should be eschewed in bowel trouble of the changing variety. A mashed head of cauliflower strained through a sieve and lemon juice are good antiscorbutics. If there is fever, serious illness, or very feeble digestion, the food must be given in small doses frequently; the food should be cold if there is vomiting or diarrhœa; *it is digested best at those hours of the day when fever is absent. Stimulants* may also be required under like circumstances; two ounces of good port or an ounce of brandy may be taken in the twenty-four hours.

When convalescence takes place, the same restrictions in diet are necessary.

The affection called "cæliac" is characterised by pains, copious pale, "oatmeal-looking" stools of very offensive odour; there is not much wasting but much flabbiness and loss of energy (see chronic diarrhœa). The treatment and dietary just described is the right treatment of this "cæliac" affection, which may be due to defective energisation of the pancreas, liver and gastro-enteric secretory glands (see p. 322 and "sluggish liver.")

Flatulence and acidity are very prone to occur, so that sugars and starches should be of the most limited amount. Malted biscuits or malted bread, or giving an extract of malt in half-dram doses with meals, may aid the digestion of carbohydrates. The extract of malt should not be too rich in sugar, lest it cause "biliousness" and further flatulence. Children of seven have told me that a teaspoonful of the malt extract took away the eyesight a few minutes after it had been taken. Some of these children take malt well when the last chyme is leaving the stomach, and especially if prescribed with an acid tonic; doubtless because the pancreatic digestion is then in full swing.

Reasons for so much regulation of regimen:—Every irritation of the intestinal surface increases congestion, ulceration of membrane and glandular enlargement—consequently causes less absorption by the lacteals and less power of digestion by the mucous membrane and glands. Every movement of the body and bowel is a further irritation to the peritonitis, and increases inflammation; the quantity of food must not be too great; the frequency neither. The stomach and duodenum

are wanted to do all the work that is necessary; they are seldom ulcerated; and so rest is thereby given to the diseased intestines.

*Tonics and specifics* are most useful if no ulceration exists, or when the child is merely ailing without many belly symptoms. Preparations of iron and quinine may be administered during convalescence. The sea-side air in an invalid chair on a fine day should be inhaled as long as possible when the child is well enough to go out of doors.

Iron, iodine, iodides, syrup of hypophosphites, various syrups of phosphates, Parrish's, Easton's, Fellow's, Lorrimer's; iodoform, sulphide and chloride of calcium, arsenic, phosphorus have all been tried; they may be prescribed as directed in the chapter on Scrofula; cod-liver oil may be given. Which preparation will suit the best must be a matter of experiment. The only result of experience which may guide is this: if the nervous symptoms are excessive, if there are many or marked vasomotor symptoms that preparation which contains most strychnia will generally be of most service. Icy cold hands and feet, whether blue or not, generally profit more on Easton's than on the other syrups. It will be found useful to ring the changes on phosphates and hypophosphites, a course of one following the other.

# CHAPTER XIII.

## DISEASES OF THE LIVER.

### BILIOUSNESS, TORPID LIVER, SLUGGISH LIVER, AND CONGESTION.

THERE is a fundamental difficulty in discussing these subjects, because we cannot be sure whether the symptoms in question are due to the liver, duodenum, or stomach. Very likely from over-feeding, improper feeding, insufficient exercise, vitiated atmosphere and constipation, the whole circle of portal viscera is involved. Congestion may also occur from chronic lung and heart disease; it is seen in the tropics; may be traced to a chill, and occurs in malarial and other fevers. For the treatment of these congestions it is essential to attend to the diseases on which they depend as well as to carry out such treatment as is suitable for the hepatic congestion. The symptoms are the same as in adults: large tender liver and spleen, with uncomfortable sensations, especially after the ingestion of food; furred tongue and costive pale motions. Slight jaundice is generally seen; a sallow complexion and symptoms of gastric catarrh may also be present. The mind is usually depressed, as in most abdominal diseases, languor and low spirits combine with irritability.

**Treatment.**—The principles of the treatment of hepatic congestion are obviously to remove causes wherever possible. Children of the well-to-do, especially at festive seasons, are apt to be over-gorged with food of a highly-spiced and rich description. The heated, vitiated atmosphere of the juvenile ball-room is usually followed by a drive in a closed carriage, with short intervals of exposure to the cold damp atmosphere.

Most of the elements conducive to the development of a sharp attack of gastro-hepatic congestion are then combined. To pass successfully through such an attack the child should be kept in bed on cold milk and barley water, or broth. The stomach should be emptied by an emetic of sulphate of copper in warm water. The *bowels* should be emptied also by a dose of calomel gr. ii., and Pulv. Jalapæ Co. gr. x., for a child seven years old. Should there be fever and restlessness, the skin may be sponged all over with tepid water, or a warm bath may be given. The *thirst* may be assuaged by sucking ice or frozen milk. This low diet and emptying of the gastro-enteric canal will suffice in a fairly healthy boy to put matters right in a couple of days.

Not unfrequently, however, the "bilious" attack develops out of a long course of indiscretions in diet. The liver and stomach have been kept constantly irritated and hyperæmic by the introduction of too much food, too frequently given, perhaps too highly spiced and irritating. The liver may have been overloaded and the blood surcharged, because the child has not been out of doors enough, and because his respiratory atmosphere has not been pure. When the biliousness has developed thus slowly, the course is usually more chronic, but practically the same treatment will serve. The emetic is less necessary. Great care will be needed in the future regulation of the diet. Too much of any of the elements of food should not be allowed. It is a good rule not to allow sauces or condiments to children. Even mustard and pepper are unnecessary for children with normal digestive powers.

The *colour of the stools* is usually clayey, and indicates deficient bile in the intestines; hence the value of rhubarb and soda, both of which substances act on the liver—three grains and six grains respectively for a boy of three. Ipecacuanha, in five-minim doses of the wine, or two-grain doses of euonymin, may be given as hepatic stimulants when the

acuteness of the congestion is over, and the stools remain pale. In the feeble with cold extremities a pale stool should be treated by the opposite method—stimulation not purgation. (See p. 322 and p. 353.)

*Irritant purgatives* should not be employed to keep the bowels constantly in action. The object is best effected by using simple salts like the sulphates of soda and magnesia, combined with the rhubarb and soda. Rhubarb is not a purgative proper, it simply increases the activities of the liver and pours more bile into the intestines; perhaps also it increases the activity of the metabolic or metamorphosing functions of the liver.

The *skin* may be acted upon by diaphoretics, such as warm baths, hot-air baths, or actual medicines (liq. ammoniæ acetatis) which are used if the free drinking be insufficient to relieve the dryness and heat of surface.

*Exercise* in the open air and drinking a quart of bland fluid a day will increase the activities of all the excreting organs—lungs, liver, kidneys, skin, bowels; this will be good treatment for a threatened or departing case of hepatic congestion.

In cases occurring in neurotic, weak, *rickety* or *strumous* children tonic treatment will be required; sometimes there may be no acuteness of symptoms; the child may be habitually languid with constipation, the stools pale, the urine too high-coloured and lithatic, the face sallow, and the furred tongue yellowish also. The diet must be assigned according to the powers of digestion; it is wrong to use powerful hepatic stimulants; the whole body requires tonic treatment, and cod-liver oil and steel wine will be far better than mere hepatic stimulants; *massage* and *cold douches* are very valuable. (See Scrofula.)

*To promote digestion* the mixture of rhubarb and soda or Mist. Gent. Alk. with nux vomica are the most suitable remedies, as not being irritant. Sometimes a tonic of nitro-

muriatic acid with quassia or gentian appears to serve better than the alkali; both alkali and acid are supposed to have a direct action on the liver. Remembering the association with gastric catarrh it will be understood that an explanation, which only considers the liver, of the action of drugs and other therapeutic measures, may readily be at fault.

### CATARRHAL JAUNDICE.

Jaundice of catarrhal sort is not unfrequent in childhood, and generally gets well of itself. It is advisable to restrict the food to the smallest possible quantities, and to get the child to drink bland fluids freely—distilled water, salutaris water or thin barley water. Keep the bowels acting—a liquid stool once a day—by means of sulphate of soda and sulphate of magnesia, equal parts, say gr. xv. with a drop of liquor strychninæ*—as often as may be necessary for effecting the purpose. This free drinking and maintenance of bowel action cleans the tongue, wets the skin, increases the urine, relieves itching and assuages thirst. The appetite is usually not good, and this is not bad for our purpose. A little milk, diluted with barley water, if necessary, to divide the curd, a little white fish—sole, whiting, cod, without the skins—dry bread or toast, and small doses of mashed cauliflower and potato may be allowed. Alcohol, fats, much sugars or farinaceous foods should be prohibited for fear of exciting further gastro-enteric catarrh. If there is much nausea and retching, an emetic dose of sulphate of zinc gr. x., or grain doses repeated every ten minutes of sulphate of copper and warm water, may do good and may dislodge mucus from the common duct.

It is entirely unnecessary to give artificially-prepared inspissated ox-gall (gr. v., t.d.s., two hours after meals). The daily liquid evacuation prevents many ill effects resulting from the absence of bile in the intestines.

Exercise in woollen garments in the open air in fine weather is very good in jaundice, as it raises blood pressure and promotes the

* A little extract of liquorice or ginger covers the taste.

cutaneous and renal functions; care should be taken in wintry and changeable weather that fatigue is not induced, and that no chill results from standing about whilst the body is heated. Low spirits and languor are equivalent to fatigue, so that enforced exercise is bad unless it remove the inertia.

If the skin still itch after what has been done, alkalies may be prescribed in the form of bicarbonate of soda (gr. vi., t.d.s.) or Vichy water, half-a-tumblerful of Celestins or Haute Rive, may be given twice a day. Warm alkaline baths are very serviceable (℥ii. of bicarbonate of soda or ℥ii. of borax in two gallons of water at a temperature of 90° F.).

Dr. Edward Kraus and others advocate the employment of irrigation of the intestines for catarrhal jaundice ("Archiv. für Kinderheilkunde," Band viii., Heft 1). A litre or more of cold water, 12-15 R., is injected into the bowel. This procedure is a good one in my opinion; but I should doubt whether it is specially efficacious. Catarrhal jaundice in children subsides altogether, if left to itself, in a week, provided that no actual irritation by unsuitable food is allowed to occur.

## CIRRHOSIS OF LIVER.

I know of nothing very special in the nature of cirrhosis of the liver in children. Alcohol certainly has caused atrophic cirrhosis in them. The cirrhosis may be a legacy of acute specific fevers, since in these fevers an interstitial change has been found; this may endure and grow into a cirrhosis. Syphilis is well known to cause an interstitial hepatitis in children; it may assume the hypertrophic character; I have seen several cases and some specimens of the kind; the organ sometimes looks in parts as if it had been steeped in carbolic acid. There is also a pericellular cirrhosis of newborn syphilitic infants. Interstitial overgrowths attend jaundice from atresia of the bile ducts—like the experimental cirrhosis of Charcot and Legg. Tubercular disease of the abdomen and general tuberculosis in the child has been associated with interstitial inflammation.

The *symptoms* of multilobular atrophic cirrhosis are identical with those of adults. The early symptoms are those of gastric catarrh and biliousness (see p. 355). The essential symptoms are ascites, hæmate-

mesis, melæna, piles, swelling of spleen, and enlarged superficial veins of the abdomen; jaundice is ordinarily slight. The liver may be felt below the ribs, and may be tender at the outset. In hypertrophic—unilobular sclerosis—jaundice is intense and an early symptom. But cases may commence thus in children and continue afterwards with symptoms like those of atrophic cirrhosis. We are much in want of further information on the real nature of hypertrophic cirrhosis; whether, indeed, it can be said to have an altogether separate pathogeny is doubtful.

Ascites and splenic tumefaction are more easily developed in children than adults, because of the low arterial blood pressure and relative inefficiency of the portal circulation in infants; see a paper on splenic enlargement by the author, "Lancet," Vol. ii., 1889.

It may prove practically useful to assert that a large ascites, with but slight œdema of the legs, is much more likely to be due to portal obstruction than to any other cause. The peculiar fluid thrill obtained on percussion in ascites is a phenomenon that, once learnt properly from experience, is of the utmost diagnostic value. I have seen so many big bellies set down as ascites which were not of this nature that I feel bound to say this much. The *diagnosis* of fluid free in the belly turns on the presence of this thrill, and on the change of the site of the fluid under the influence of gravitation; but these things are the same as in the adult.

**Treatment.**—The case at the first outset is seldom to be differentiated from gastric catarrh and hepatic congestion of the chronic, though varying kind; and the treatment should be the same as for those conditions. All the symptoms are liable to vary from day to day; yet the causes of this variation are unknown. Even when the diagnosis is assured the medical treatment does not alter. Maintenance of the action of the skin, kidneys and lungs should be secured by the means described under Hepatic Congestion. It is not necessary to keep the patient abed unless serious symptoms are present. A slight ascites may disappear for a time under the influence of tonics, fresh air and gentle exercise.

*Cerebral symptoms*, sudden supervention of more jaundice, marked ascites, melæna, hæmatemesis and the like, are signs for keeping the patient in bed.

*Cerebral symptoms*, delirium, restlessness, slow or irregular

pulse, drowsiness, convulsions and coma, often associated with epistaxis and purpura, indicate grave toxæmia from inefficiency of the metabolism, aided doubtless by impairment of the functions of the excretory organs—skin, intestines, kidneys and lungs. These organs must be put into vigorous action by hot air baths, free drinking of water, the administration of alkalies and watery purgatives. Treatment is seldom effectual in such cases, or if the symptoms disappear for a time they are prone to recur. Bleeding in such cases may remove the coma, but this generally proves a useless relief.

The *diet* in chronic cirrhosis must be of a nutritious kind, with a very moderate supply of albumen—meat, eggs, milk; it should be given in a digestible form—minutely divided and in small quantities at a time. Mist. Gent. Alk., with nux vomica or two to five grains of pepsin, may be given to aid digestion. Alcohol, sauces, condiments, and hot spices or irritants should be prohibited. Fat and starchy and sugary matters must be given cautiously. The powers of the digestive apparatus, as judged by the symptoms and stools, should be the guides as to the amounts of such substances to be ingested. The bowels and stools must be kept in order as recommended under hepatic congestion. Doses of euonymin gr. ii. or iridin gr. i. may be useful to bring bile into the intestines. Bile promotes pancreatic digestion, peristalsis and antisepsis or rather relative sweetness of the contents of the bowels. Simple saline aperients—carbonate of magnesia, sulphates of soda and magnesia, phosphate of soda—are the best. The phosphate, ten-grain doses in milk, is specially recommended by Ringer when the stools are pasty and white.

*Hæmatemesis* or *melæna* seldom demand special treatment. Ten-grain doses of gallic acid or ten-minim doses of liq. ext. of ergot or grain doses of acetate of lead, with a sixth of a

grain of opium, may be prescribed, but are in my experience useless. A little powdered opium, or a few drops of laudanum, semi-starvation and absolute rest, with a little ice to suck, is the best treatment.

*Pain about the belly*—which with vomiting sometimes indicates peritonitis—may be relieved by the usual hot applications of light poultices and opium fomentations, hot spongiopiline, mustard leaves and turpentine stupes.

*Ascites* may require special treatment :—

*Diuretics* and *tonics*.—The daily use of salines, combined with iron and strychnine as tonics, will often remove a certain amount of fluid.

℞ Sodæ Sulph., gr. xv.
Magn. Sulph., gr. xv.
Liq. Strych., ♏i.
Ferri Sulphat., gr. ii.
Glyc., ♏xx.
Aq., ʒss. t.d.s.

for a child seven years old.

Iodide of iron gr. ii., or syr. iodide of iron ʒss. t.d.s., or saccharated carbonate of iron gr. v., may be used as tonics instead.

Restriction of the amount of fluid imbibed—a dry diet—should be practised as for pleuritic effusion. The resin of copaiva (see p. 255) has, so far as I have seen, proved valueless. Infusion of Digitalis in ʒss. doses may be used; some prefer squills alone or in combination. (See the "Dropsy Pill," p. 252.)

*Paracentesis* is usually required when the amount of fluid present is large. The breathing is often oppressed by pressure on the diaphragm; the sitting posture may be the best. Considerable tympanites often aids the ascites in causing distension of the abdomen. The best method of paracentesis is to use a Southey's tube made perfectly clean and aseptic by

being kept or boiled in 1 in 20 carbolic acid for some time. The fluid should drain away slowly, so that the risk of syncope supervening from sudden loss of tension may be lessened. Afterwards continuous uniform pressure should be kept up by a carefully applied bandage of aseptic flannel. The tube may be inserted after a preliminary skin incision through the linea alba, midway between the pubes and umbilicus. The cases are rare which require a more rapid removal of fluid, but repeated removals may be required. In adults, cases of repeated paracentesis for ascites due to cirrhosis have been recorded as recoveries. Boracic acid fomentations should be used about the puncture, and everything kept scrupulously clean. Peritonitis is not uncommon after paracentesis; it may be excited by the puncture, but is mostly predisposed to by the macerated and emasculated condition of the peritoneum and patient. In one case of so-called recovery after repeated paracentesis in the adult, the whole of the peritoneum was obliterated by firm fibrous adhesions; any ascites would have been impossible.

Systematic binding with cotton-wool and a flannel bandage so as to make even, continuous and firm pressure; or strapping the belly uniformly and carefully with broad strips of diachylon plaister with the same object, may be used, from the first, to cause absorption of fluid; or it may be employed after paracentesis.

Infriction of mercurials is a dirty method, and not very successful; the dropsy pill is preferable; the oleate of mercury, painting daily or every other day with the five-per-cent. solution, is more cleanly.

**Acute yellow atrophy** rarely occurs in children. In one case the liver was felt at first two fingers' breadth below the margin of the ribs; there were some anæmia and some jaundice; after an occasional epistaxis the male child, aged twenty months, died with profuse hæmatemesis and melæna

three weeks after the first noticeable symptom—jaundice—began ; it was a butcher's child and the only other child of the family died in the same way, so the parents said ; was it some phosphorus-like poisoning ?

## FATTY LIVER.

The edge of a fatty liver often sinks away under palpation ; the signs and everything else about it are they not written in every text-book of medicine ? In children there is no real difference. A want of fresh air, *i.e.*, of oxyhæmoglobin, is a general cause of fatty accumulation. The change is usually accumulation or infiltration rather than degeneration of the working protoplasm. Cod-liver oil has been set down as a cause. Some cases have been altogether unexplained even by a necropsy.

The treatment is that of the association of the fatty liver. Most careful regulation of diet, with avoidance of excess of hydro-carbonaceous material—fat, sugar and starch—is needed for at least two reasons : (1) not to increase indigestion, (2) to remove the cause of fatty accumulation by restricting the sources of its formation. Hygienic measures of the out-door fresh-air type, with avoidance of chills by the use of chest and belly protectors, are indispensable. Cold douches and massage should be practised, even if the patient be confined indoors. Exercise outdoors in a dry bracing marine climate when the patient is a convalescent should be ordered if he can walk.

## HYDATID OF LIVER.

There is no difference between this complaint in children and adults. The hydatids may be only in the liver, or they may occur in association with hydatids elsewhere. A remarkable case of Dr. Brailey's had hydatids in the orbit, brain, liver, and spleen. The treatment, whether the hydatid has

suppurated or not, is exactly that recommended in every text-book of general medicine.

Suppurating hydatids may be mistaken for empyema. I have seen urticaria follow puncture of the hydatid in a female child aged seven years; *injections* of tincture of iodine (ʒi. to ʒiv. of water), and the slow method of ensuring adhesions by the use of caustics over the head of the tumour are not recommended. The respiratory movements of the liver covered by diaphragm are well seen in cases in which the cyst is attacked from the back, the tenth rib being resected for two or three inches. A certain degree of intracystic tension is needed for the life of the cyst, therefore a mere reduction of this necessary tension is held by many to be the correct treatment.

# CHAPTER XIV.

## URINARY DISEASES.

### THE URINE.

It is important always to examine the urine of every child, and especially if the complaint for which it is brought be serious or obscure. The napkins of infants may yield valuable evidence of abnormality : they may be stained with bile or urinary pigment, or stiffened from pus. The quantity of urine passed in the twenty-four hours in childhood, being dependent essentially on pressure in the renal arteries, is not constant, even in the same child. Any disturbance of general blood pressure, as from nervous derangement, gastro-intestinal disorder, or great variation in the perspiration, may either increase or decrease the quantity. The quantity is lessened from want of drink, vomiting, diarrhœa, sweating, from diminished blood pressure, as in heart disease with failure of the myocardium, in cardiac debility from chronic wasting disease, from diphtheria and acute specific fevers. In general pyrexia the flow is diminished from retention of water in the system, and perhaps from other causes, as weak heart and disordered kidneys.

**Polyuria and anurea** may be due to nervous disorder of central or reflex origin ; they may be passing or lasting, and are of frequent occurrence in children. Thirst and frequent drinking, gastro-intestinal derangement, especially if associated with colic, epilepsy, hysteria, convulsions and ague, cause transient polyuria. Polyuria or diabetes insipidus may result from a blow or fall on the head, on the forehead especially, from meningitis or a tumour about the base of the

brain or cerebellum, and from affections of the kidneys and bowels.

Neurotic individuals, infants, children, or adults, generally have arteries which are too palpable; usually due to high blood pressure; yet I do not think such are specially prone to sclerosis of the arteries. When one stratum of plain muscular tissue is in a state of contraction it should be considered whether other strata of unstriated muscular tissue are in the same or a different state; a goose skin, cold hands and feet are often associated with contracted arteries; so is constipation; compare also spasmodic asthma and croup; observations on this point should be further extended. The process of micturition is far more frequent, irregular, irritable, and variable in inverse proportion to the age; the infant is a born-neurotic; everyone knows the variation in frequency of micturition in adult neurotics, sometimes the acidity varies in the same fashion, dysuria may give place to anuria or painless polyuria. Anuria is often associated with an acid urine not necessarily in proportion to the scantiness.

The **amount of urea (azoturia)** excreted in children is usually greater than that excreted by adults during the same period of time. Even without disease, and without much concentration, the cold nitric acid test yields frequently a layer of nitrate of urea crystals.

The **urine**, as in adults, should be *acid* and *clear*. It is often too acid and turbid from urates; a goose skin, cold feet and hands or a tendency thereto, constipation and high tension pulse are frequent concomitants of acid urine. Indigestion and biliousness (see p. 37) is the most frequent cause of *excessive acidity* with excess of lithates, and uric acid crystals may be detected. The urine is not seldom *alkaline* and turbid when passed from phosphates in wasting diseases and chronic illnesses. Temporary alkalinity may be noticed soon after meals—the "alkaline tide."

Excess of *indican* in the urine may be present from many causes; it often accompanies albuminuria and disease of the small bowel—ulceration, intussusception, and severe catarrh (inflammatory diarrhœas); it may be discovered by Heller's test. Half-an-inch of hydrochloric acid

in a test tube, to which three drops of urine and two of nitric acid are added, will be followed by the slow development of a purple colour, which gradually disappears; the coloration may be intense; urine which contains much indican often yields a very dark ring of pigment with the cold nitric acid test, and the colour of the urine is often a very clear saffron or olive yellow.

**Pyuria** may be due to admixture of pus from the vagina or vulva; pyelitis and cystitis may cause pyuria; I have once seen pyuria result from the opening of an abscess into the pelvis of the kidney in a girl aged seven, the abscess also opened into the ileum, and much pus was definitely ascertained to be discharged with the urine as well as from the bowel.

Dr. Gee draws attention to a temporary pyuria, probably due to catarrh of the whole urinary tract. There may be symptoms of cystitis—frequent small, painful micturitions, sometimes unavoidable incontinence; but there may be no symptoms at all, the condition being observed accidentally. The temperature may be high and the child may look ill without any special urinary symptoms.

In cases of presumed cystitis of this description the treatment should consist in keeping the child abed even if there be no sense of illness, but still more if there be fever; the belly should be protected by a flannel binder; the diet must be regulated; for a few days at least a milk diet (milk, milk pudding, a little rice, and bread and butter) should be kept; even the cow's milk may require division of its curd by barley water, since indigestion may keep up the complaint. Meat and animal broths should be interdicted on the plea that the kidneys would have to turn out more urea and uric acid and urates and thus expose the mucous lining of the urinary tract to greater irritation.

## INCONTINENCE OF URINE.—ENURESIS.

Inability to hold the water, or a great difficulty in doing so, and wetting the bed are excessively common in boys and girls. It may be an affair of the moment or may prove extremely chronic and obstinate, lasting for years; girls are more prone than boys to the inveterate variety. The chief causes are simple indifference and indolence, a tight or long foreskin, phimosis, adhesion of the prepuce to the glans penis, atresia of the meatus urinarius, a vascular polyp at the same orifice in girls, ascarides or gastro-intestinal irritation, constipation,

rectal polypi, anal irritation from fissure, &c.; acid, lithatic urine from indigestion and biliousness, vulvitis, stone in the bladder or kidney, and finally the *neurotic diathesis* as evidenced by persistence after all treatment, by its occurring in several members of the same family, and having sometimes occurred in the father or mother; the heredity may be traced even further back.

The first mentioned cause is, in my experience, a rare one. I have not needed, therefore, to prescribe whipping or a cold-water sousing.

*Circumcision* is the best cure for the three next causes. (See Surgical Works.) The knife removes the fourth cause, and a ligature or touching with nitric acid the fifth. The treatment advised in Chap. II. will answer for the next three.

*Rectal polypi* may be carefully torn off with the finger in searching the rectum, whose posterior wall they most affect. Fissures and sores about the anus will usually cease to worry if thoroughly cleaned, and the clean surface attacked with nitrate of silver. (See Constipation.)

*Acid lithatic urine* may be rendered less irritating by attention to hygiene and diet, and by the administration of alkalies and bitters. (See Indigestion.) Sounding with rectal palpation may discover a vesical stone. A tubercular bladder and ureter may be felt per rectum. Curiously enough enuresis has been cured by *sounding* even when no stone has existed. *Dilatation* of the urethra in girls has also been employed successfully as a *dernier ressort* in the treatment of enuresis in them. (For Stone in the Kidney see p. 380.) The last cause of incontinence is the most difficult to remove, but hygienic measures—diet, exercise, cold douches, and the like—are potent therapeutical agencies.

In a subject of so much importance it will be necessary to study the *treatment* and *pathology* more closely. The great frequency of incontinence is an excellent illustration of

the canon of infantile neurology, that the cord is dominant and cerebral inhibition subsidiary. Control of the lower centres and of passions is less easy in children than in the healthy grown up ; the child is much more a machine of reflex activities than the adult is.

The micturition centre in the lumbar cord is more complicated in function and structure than the defæcation centre ; action and inaction exist side by side ; the detrusor urinæ is inactive, the sphincter is active when micturition is not in progress. The action and inaction change places when urination occurs. The chief cause of micturition is a reflex stimulus chiefly from the neck of the bladder ; this stimulus or sensation is associated with a cerebral feeling—a desire to pass water. The micturition centre may be controlled by cerebral impulses passing from the brain to lumbar part of the cord; these cerebral impulses are probably necessary for the *neat* performance of ordinary micturition.

In enuresis the child is unable to control the centre when the feeling or desire to make water occurs; or the centre may be so active and irritable that it explodes or discharges almost before the cerebrum is made aware of the state of the bladder. The neck of the bladder being the most sensitive region—trigger-area—for the firing off of the micturition centre, any irritation there should be lessened as far as possible. So it is advised to keep the *pelvis as high* as possible during sleep, when all reflex actions are excessive. Sleeping with the *head* and *shoulders low* by inclining the mattress, with a view to keeping the urine at the fundus of the bladder, seems therefore a rational procedure. Sleeping on the back appears to be conducive to bed wetting, probably because the lumbar centre is more congested and irritable in this posture; a bandage enclosing some hard body, like a pile of coin or reel of cotton, may be fastened round the hips, so that the hard body rests on the sacrum.

But our best means for combating enuresis is the employment of drugs, which *lessen* the *activity* of, or strengthen the *reflex mechanism*. Such agents may act chiefly on the sensory nerves, or chiefly on the centre, or chiefly on the motor nerves and muscles. The tonics—whether exercise, cold douche, strychnia and the like, perhaps increase the tone of the sphincter vesicæ. But everything in this matter is not yet known. Large doses of belladonna tincture (♏x., t.d.s., to begin with for a child three years old), and pushed till the pupils are large and the throat dry, is certainly a useful remedy. It may be necessary to push its administration up to the limits of safety, and to persist in its use for some days, and that even after the disappearance of the symptom. The discontinuance of the medicine should not be sudden and complete, but gradual—the amount being first reduced, and then the number of times the dose is given. It is useless to give belladonna without first dismissing any obvious exciting cause; it is also important to limit the evening drinks, and to make the child completely evacuate the bladder before going to bed. The habit of bed wetting may often be broken by waking the child every four hours, or less often, during the night, and insisting on complete micturition.

*Liquor strychninæ* in drop doses three times a day, or three minims of nux vomica, with Mist. Gent. Alk., has been very useful in my hands for children of five years of age; the alkaloid may be pushed up to three or five drops, the patient being carefully watched; I have seen this succeed in obstinate cases, especially in girls, about the commencement of the second period of dentition. *Tincture of perchloride of iron* in large doses (♏x. in ʒss. glyc., t.d.s., for a child of seven) is often valuable.

Alkalies and salicylate of soda will cure some obstinate cases in which there may be reason to suspect gout or rheumatism, hereditary or acquired.

Other remedies that are sometimes successful when the above have failed are:—Liquid extract of ergot in ten-minim doses; syrup of chloral hydrate, ten minims; bromide of sodium or ammonium, ten grains; benzoic acid, especially when the urine is alkaline, ten grains; cantharides tincture in drop doses; camphor, especially if there be priapism, in five-drop doses of the strong spirits; infusion of digitalis in half-dram doses; borax in ten-grain doses; nitrate of potash in ten-grain doses; turpentine, ten minims; fluid extract of rhus toxicodendron or aromatica, ten minims; tincture of hops, half-a-dram. All these doses may be used three times a day for a child of seven. They may be prescribed in 3ii. of water with the addition of twenty drops of glycerine. Turpentine should be suspended in mucilage or given in capsules.

I have often used the *constant current* of about the strength of two milliamperès. The positive pole is placed over the sacrum, the negative is stroked about the hypogastrium, under the penis and perineum, it should be used once a day for ten minutes; sometimes a smart shock from the faradic current proves effective; it cures a few cases when other means have failed; the faradic current of light intensity has been used in the same manner as the constant current.

A blister over the nucha or sacrum may be used in chronic cases, and the sore kept open with Ung. Sabinæ for a few weeks. The use of a strong caustic to the neck of the bladder, which should be done by a careful surgeon, has been recommended.

Lastly it should not be forgotten that the cases cure themselves not unfrequently at the age of seven and fourteen years, *i.e.*, about the beginning of second dentition and puberty. I cannot advise the *frequent nocturnal closure* of the preputial orifice or of the external meatus by collodion or other mechanical means. Mechanical obstruction does not prevent the bladder from contracting, and Dr. F. H. Champneys has adduced some evidence and more arguments to show that incontinence, with its excessive vesical contractions, may lead to distension of the upper urinary passages.

## RETENTION OF URINE

may be due to inflamed phimosis, atresia of meatus, impacted calculus in any part of urethra, rectal irritation from any source, constipation, worms. I have made a necropsy on a male infant *one year old* in which soft calculi were found in the right renal pelvis, and in the bladder, and one large fusiform one blocked the urethra at its front part; the infant died in great agony; it had not been treated. The urethra may

be ruptured or the bladder paralysed by blows on the perineum and hypogastrium respectively. Surgical works should be consulted.

Atony of the bladder may result from prolonged retention, and may be a cause of retention, as in pyæmia, typhoid, and other long-continued fevers; in peritonitis there often is retention.

## HÆMATURIA.

The commonest causes of hæmaturia in the child are gravel, calculus and Bright's disease; tubercular ulceration of the kidney pelvis, urethra and bladder is not uncommon, and does sometimes cause hæmaturia. Sarcoma of the kidney may not bleed into the renal passages at all; a little blood may come from cystitis and from a urethral polypus; severe purpura may be a cause in children; boys chiefly of Natal suffer from Bilharzia hæmatobia.

Sometimes hæmaturia occurs in company with dysenteric diarrhœa, of which infants a few months old may afford examples; I have seen it as early as seven months. In many cases the urine is very acid, but there is no other obvious cause; doubtless vasomotor fits occur in the urinary passages either as a primary or secondary neurosis, bursting blood capillaries—allied to arthritic hæmorrhages elsewhere. The **treatment** should be that of the disease it complicates. The bladder should be frequently sounded by a careful surgeon.

In the endemic parasitic disease, the blood usually comes from the bladder. The characteristic ova are oval, with a spur at one end; they are $\frac{1}{150}$ inch in length. The lively ciliated embryo may be seen after the chitinous shell is ruptured. Various means have been recommended for the treatment of this form. Santonin gr. ii., liq. ext. male fern ℥xv., turpentine ʒss., may be given as for worms. Injections have been employed of iodide of potassium gr. xv. to ʒi.; or half-a-dram or a dram of a saturated solution of santonin in alcohol, liq. extract of male fern ʒi. to ʒi. of thin barley water. These remedies may set up slight cystitis, which soon subsides under the influence of bland fluids and infusion of buchu ʒi., with succus hyoscyami ℥xv. three or four times a day for boys about ten.

## ALBUMINURIA AND AZOTURIA.

Functional albuminuria is very common in infancy and childhood; any fever may cause albuminuria apparently with greater facility in children. Chronic disease, with debility and without anæmia, may give rise to albuminuria in children without there being any decrease in the urea discharged. Hypoazoturia—diminished excretion of urea—is said to occur in infancy not unfrequently; the concomitant illness may look like gastric catarrh, but there is also a remarkable inelasticity of the skin, such as is seen in choleraic diarrhœa.

Transient albuminuria may be due to admixture of blood, chyle, lymph, pus or semen from masturbation, escaping with the urine.

## ALBUMINURIA AND BRIGHT'S DISEASE.

There is so little that is special to Bright's disease in children that, but for its frequent occurrence after scarlet fever, it might almost have been left out of consideration did not this book aim at some completeness in regard to the therapeutics of childhood.

Doubtless a chill, especially in convalescence from scarlet fever, can cause nephritis; the occurrence of spontaneous or autochthonous Bright's disease must be admitted at present; measles and inflammatory diarrhœas may be causes in infants.

Usually, the onset is well defined in scarlatina and after exposure to the causes of chill; but the symptoms vary remarkably; pyrexia and vomiting are most frequently present; there may be no fever at all; diarrhœa may go with vomiting. A dry skin and dropsy of the face or eyelids are almost constant. The dropsy may be absent from beginning to end, or it may be most extensive and rapid, with hydrothorax, œdema of lungs and rapid death; there is then generally associated paralysis of the myocardium and of the circulation. Occasionally convulsions and drowsiness or coma are the first or early symptoms; the drowsiness may occur without fever and without convulsions; pleurisy, pericarditis, peritonitis, pneumonia or bronchitis may develop. The

urine may be bloody or smoky only ; its quantity is always diminished; the reaction generally acid ; specific gravity high, 1030; blood casts and renal epithelium are characteristic of the first stage ; hyaline and granular casts occur later. The urine may be highly albuminous and contain casts, and yet there may be no other symptoms whatever pointing to renal disease. **Chronic** Bright's disease may be of the granular, large white or lardaceous description ; all these forms have been seen even in young children. Probably a long past scarlet fever is a not unfrequent cause of the first and perhaps of the second ; the course and clinical signs are apt to be erratic ; any symptom may occur ; sometimes headache, at others dropsy, again anæmia, now vomiting, nausea and indigestion ; or perhaps only constipation and a dry skin. The clinical pictures are fully as various as in the adult. Headache, vomiting, and optic neuritis with retinitis, even in children, may mean Bright's, not brain disease ; there may be no albuminuria, the urine is usually increased in quantity in the granular and diminished somewhat in the white kidney ; it is possible for it to be absolutely normal, even chemically, with a lardaceous kidney.

**Treatment of acute Bright's Disease.**—Of the importance of hygiology in the treatment too much cannot be said. Protection of the child from cold is the first grand object of hygiene ; maintenance of the action of the skin, lungs, and bowels no less important; these are *prophylactic* measures also.

The bed must be kept so as to ensure complete rest, that the slight expenditure of material may give the emunctories as little to do as possible. The bed-clothing must be sufficient, but not so great as to increase pyrexia should this be present. The room must be comfortable and warm (65° F.), and ventilated without the child being exposed to draughts.

*Drinks* of bland fluids, such as thin sweetened and lemon-

flavoured barley water, should be administered freely and frequently; thirst is not always indicated by symptoms or signs in the child; this free drinking raises blood pressure, promotes sweating, bowel action and renal filtration. The *skin* and *bowels* must be got to act freely and continuously. The best method is to place the child between blankets and use the *hot air bath;* a large cradle covered with bed-clothes makes the air space about the child's body, and the air is heated by a spirit lamp guarded in a stove, with the flue placed at the outside of the bed.

Frequent dram doses of solution of acetate of ammonia freely diluted in barley-water or milk, to a child of seven, may be given and repeated so as to keep the skin wet. If these measures do not answer, an eighth of a grain of pilocarpine may be injected under the skin, or half-dram doses of infusion of jaborandi given as often as necessary. I do not recommend diuretics which act on the heart, because such—digitalis, caffeine, squills, etc.—tend to increase the amount of albumen discharged, and perhaps maintain renal disease; when there is palsy of the heart and circulation, the myocardium dilating and the blood tension falling, there is nothing to be done but give digitalis and brandy.

The best *purge* is compound jalap powder given in as large doses as may be necessary, say gr. xx. to start with. Alcohol in any form should be prohibited. The heart and circulation seldom require stimulation; they are mostly already over-excited; but paralysis may supervene. The diet should be plain milk and barley water, or vegetable soup carefully strained. Meat, eggs, and, to be perfectly consistent, animal broths—as containing much extractives chemically allied to urea—should be interdicted.

*Inflammatory chest or belly complications* should be treated by hot moist local applications—fomentations under oil silk or poultices; mustard leaves or plaisters for relieving pain may

be kept on ten minutes; liniments of chloroform are useful; stimulants may be necessary; tepid sponging may reduce fever, or a tepid wet packing with blankets over the wet linen may reduce fever, relieve discomfort and improve the renal position. It is best to *avoid* mercury, cantharides, blisters, turpentine, internally or externally, and opium in all kidney diseases in children.

When improvement sets in the greatest care must be taken to avoid checking the functions of the skin, kidneys and bowels. The medical sweating, purging and diuresis may be discontinued. But if the child be allowed to get up from bed —which, indeed, is not to be done any sooner than can be helped—a wise child will easily remain in bed if he be old enough to have matters explained to him—the whole surface, except the features, should be uniformly protected with woollen clothing of sufficient thickness to prevent any risk of chill. He should remain in the house and in the same room, kept at a uniform temperature. Be firmly convinced that the erect posture increases albuminuria. Gradually if the albuminuria be surely subsiding he may go about the house—desquamation should of course be completed first—but the rooms must be kept warm and free from draughts by assiduous attention to the doors and windows; all these considerations apply naturally with most force during seasons of doubtful weather.

For promoting the return to health, and for dispersing the last of the albuminuria, nothing medicinally can equal some preparation of iron; it should not be prescribed straight away in large doses; the tincture of the perchloride is the best as being most tonic, the bowels must be kept acting at least once a day or the iron will do no good; the tincture may be given in five-drop doses with twenty of glycerine and a tablespoonful of water three times a day, say for a child seven years old. Dram doses of steel wine or two-grain doses of

ferrum redactum or some saccharated carbonate of iron may suit better.

Dropsy may certainly occur in scarlatina, and be very marked and extensive without any albuminuria; it should be treated by absolute rest, perfect warmth of surface, tonics and diuretics as above indicated.

As *convalescence* continues the diet should be gradually improved, but the amount of meat and eggs should always be limited; most children eat more than is absolutely necessary. Since the kidneys are crippled for the time being at least, is it not right to underfeed in order that the task may be well within the crippled powers of the kidneys? The food must be digestible in kind, and it is desirable to make it palatable only if want of appetite exists. The food should be fresh, not stale, preserved, tinned or salty. White fish, mashed potato and cauliflower, well-done spinach and Brussels sprouts, are suitable articles, with bread and butter, cocoa and milk. A little wine may occasionally be necessary, say ℥i. with dinner.

The persistent and early use of quinine during scarlatina is said to obviate nephritis by preventing the growth of the protoplasm of Bowman's capsule; this is problematical; hypodermic injections of ergotin (gr. iii., for a child aged seven years), gallic acid gr. x., local leeching—three to five—have been used to abate acute nephritis at its outset; they are of doubtful utility.

The **treatment** of **chronic Bright's** disease—lardaceous is not considered here—requires the same care and attention to prophylaxis and general hygiology. The *diet* requires restriction in respect of the proteids ingested, on the principle of not giving the emunctories, and especially the kidneys, more urea to excrete than can possibly be managed by them. Uræmia is the great danger; probably this toxæmia is responsible not only for the brain symptoms, but for the anæmia, dropsy and the like. Skimmed milk is an excellent drink and food for chronic renal disease; increased secretion of urine and remarkable benefit often follow the use of this simplest of all foods; the patient requires the same woollen clothing as in convalescence from acute nephritis, and the same care in the avoidance of the causes of chill. The *skin* is to be kept acting by these

means, by bathing and in some cases exercise. *Massage* may be useful, but it should not be vigorously done, lest the excess of waste products prove too much for the kidneys. The exercise should be in the open air, therefore a fine warm climate, with plenty of sunshine and few sudden variations in weather, is highly necessary.

The *bowels* must be unloaded diurnally, and the habit of going after breakfast should never be broken. Saline purges, such as Hunyadi Janos, Eno's fruit salts, sulphate of soda, and magnesia are the best. If there is indigestion, the principles recommended under that section may be carried out. A little (℥i.) wine and water for a child of seven may be given with the meals if there be debility or poor digestion. Iron is the most important medicine, and the tincture of the perchloride the most valuable preparation.

As for agencies to diminish the amount of albumen, I am sceptical of their action altogether; the most valuable are the alkalies, and the Mist. Gent. Alk. is a good mixture.

*Dropsy* should be treated by purging and sweating by hot air baths, liquor ammoniæ acetatis 3ss. with tinct. ferri acetatis ♏x., and purges of Pulv. Jalapæ Co. 3ss., or elaterium gr. $\frac{1}{16}$ in sugar of milk gr. iii. repeated as often as necessary to ensure several watery stools; some caution is necessary with elaterium.

The amount of *liquid* imbibed should not be restricted. Diuretics which raise blood pressure and act as heart tonics, remembering the tendency to cardiac hypertrophy and increased blood pressure, should be avoided, as I am sure they increase the amount of albumen discharged. If we are to believe in experiments, the more albuminuria and the longer it is continued, the greater and more lasting will the renal lesion be. Saline diuretics are the best; nothing can be better than acetate of potash gr. x. mixed with acetate of iron ♏x., and solution of acetate of ammonia 3ss. freely diluted for a child ten years old.

Rarely renal dropsy may require *drainage* from the ankles or belly by incisions or Southey's tubes. Every instrument and article used should be clean and aseptic. Since erythema and erysipelas are prone to occur the parts should be kept warm by hot boracic acid fomentations protected with oil silk and clean domette bandages.

## LITHIASIS AND RENAL CALCULUS.

Overfed or rickety children, or those of rheumatic and gouty stock, frequently pass uric acid. Urine containing

blood equally diffused through it is the commonest symptom of renal calculus. The absence of renal colic is quite remarkable in children with undoubted stone in the renal pelvis; indeed, there may be no symptoms or signs of renal calculus; or *pyuria* may be the only sign. Besides bowel complaints, spinal disease and kidney trouble cause *umbilical pain*. Sometimes there are hæmaturia, frequent dysuria and pain on movement without renal colic; these symptoms may point to calculus in the bladder, though the stone may not be there but in the kidney; the kidney may at times be felt unduly on deep pressure in the loin. The digestive and assimilative apparatus are the most important organs in the child; they are also very sensitive organs; the kidneys may be less at fault than the liver, stomach and intestines; metabolism may be altered; according to some, there is hepatic reversion; the liver returns to the reptilian and avian type, makes more uric acid, or its immediate antecedent, and less urea. Any influence in the environment of the child may effect this change; over-feeding, especially with indigestion, of proteids, sugars and starches are potent causes of "hepatic reversion." Influences from the brain and cord may affect the liver when their nutrition is baulked, as from over-study, mental shocks, excessive emotional expenditure of energy, or inherent innutrition of the nervous system. A want of fresh air and the causes of chills, perhaps acting on the stomach and intestines as well as on other organs, are also agents in the causation of lithuria or lithiasis. The metabolism is frequently excessive in infancy and childhood; more urea is made per kilo of body weight, perhaps 2 grammes for every 3 kilogrammes of body weight; the adult proportion is 1 gramme of urea for every 3 kilogrammes of body weight; uric acid is often deposited in the kidney tubules and all along the urinary tract.

There may be no symptoms at all, but sometimes the

mere passage of gravel or sand (uric acid), in not large quantities, may cause pain of renal character, even fainting and vomiting, dysuria, hæmaturia and pyuria ; yet there may be no concretion, for free drinking of salutaris or distilled water may remove all symptoms ; I have watched for two years a case of this kind in a boy aged $5\frac{1}{2}$-$7\frac{1}{2}$ ; if he leaves off his quart a day of water, he passes much sand, and often the urine is smoky, occasionally bloody, with other symptoms ; whilst taking his full drink the water is free from albumen ; he has been repeatedly sounded for stone, without result ; he has improved on a tonic of sulphate of iron and tincture of nux vomica.

Pyonephrosis and hydronephrosis may result from renal calculus in childhood ; abscesses may also be perinephric in situation.

The metabolism participates in the general irritability, irregularity and variability which are so characteristic of actions and processes in infants, in inverse proportion to age ; as the result of direct observations on the discharge of urea it may be affirmed that the quantity passed varies from day to day, the fluctuations being greater than in the adult ; not apparently explicable on any hypothesis as to a similar variation in the appetite or the quantity of food ingested.

**Treatment.**—*Hygiology* rules the situation ; generally speaking, kidney stone is diagnosed too often, because frequently there is only gravel or sand, not concretion. The regimen should be rigidly regulated ; not only should too much meat and eggs be forbidden, too much sugar and starch are also injurious. Indigestion should be treated as elsewhere recommended. Jellies and gelatinous substances should generally be avoided both in gout and rheumatism.

The skin may be kept secreting by warm woollen clothing *cap-à-pied* and by exercise, or massage in infants. Cold and damp may be avoided by the same means, and by careful

attention to the bedroom, play-room and nursery. The art of regulating the nervous system should be studied (see p. 386). Drinking is a most important consideration: two pints a day for a child of seven is not too much; distilled water, aërated, or salutaris are the best; thin, sweetened and flavoured barley water is good; the flavouring may be done with any of the cook's essences, the quantity used should be the least possible —of vanilla, lemon, aniseed, &c. Saccharine well deserves a trial, for food and drink may be rendered sweet without entailing the use of more than a few drops of it. Animal broths and rhubarb as yielding oxalates should be prohibited. If such measures do not clear the urine of blood and sand, alkalies should be prescribed; bicarbonate of potash or the citrate may be given in ten-grain doses three times a day for a boy of seven; the urine, to be lithontriptic, should be kept neutral of alkaline; this is the indication for the amount of alkali required. Stimulants should not, as a rule, be ordered. If the child be feeble, however, a little sound claret or high-class wine may do good; a wineglassful to dinner for a boy of seven; the dinner should be at midday; advise half-an-hour's rest before and an hour's rest after the principal meal, if possible in the reclining or, better still, recumbent posture.

Nephritic colic may be met by hot baths, temp. 98° F.; hot fomentations to the loins, and free potations of warm bland fluids like thin flavoured barley water. Opium may be given if these measures do not relieve pain; five drops of laudanum may be given, if there be no evidence of renal disease, to a boy of five, and then drop doses every quarter of an hour till relief is obtained; care is required not to narcotise the child. Massage over the suspected kidney and downwards along the ureter may do good. Belladonna tincture may be given in five-drop doses with or without the opium. If the pain is unbearable and uncontrollable the inhalation of

chloroform may be legitimately used to relax the spasm of the pelvis and ureter.

The persistence of symptoms should be regarded as an indication for renal sounding either by punctures with a fine needle or cutting into the loin by a careful and " antiseptic " surgeon. Nephrotomy should be performed if a stone be detected.

Tonics of iron and nux vomica sometimes remove the habit of passing gravel and sand in debilitated atonic, though not necessarily anæmic boys; compare this with the treatment of pale stools; lithiasis and pale stools may be chiefly the expression of want of nervous energy in the liver cells; in human beings the tissues had best be regarded as elaborated nerve endings.

## KIDNEY TUMOURS.

Congenital hydronephrosis and sarcoma are the chief kidney tumours; the tumour is the chief indication; hæmaturia is a sign of sarcoma, but I have seen four cases of renal sarcoma which never had this symptom.

The physical signs are the same if the tumour is renal, suprarenal or extrarenal. In suprarenal cases the external genitals are sometimes over-developed and covered with long large hairs even in babies a year or so old. The physical signs of tumours of the renal region are written in any book on medicine. Secondary deposits nearly always occur in the glands of the belly and mediastinum, in the liver and lungs.

The sarcoma may fluctuate from the softness of the round-celled growth into which blood is often extravasated. The exploring syringe may draw off blood and cells if the growth be a sarcoma; if hydronephrosis, clear fluid which need not contain urea may be withdrawn; pyonephrosis may occur, and may not always be indicated by pyuria and by chills with fever.

Renal sarcoma is most frequent during the first few years of life; all the cases I have seen were under four years of age. Wasting and anæmia are the chief symptoms of sarcoma; pain is not frequent; hæmaturia may occur; most cases die before a year has elapsed after the detection of the tumour. Hydronephrosis may last longer; double hydronephrosis usually causes still-birth; in one case the kidney was cystic, like a small bunch of grapes; the other kidney was hard and fibrous, but functional; there was remarkable lipæmia; the blood looked on the post-mortem table like milk, or as if it had been mixed with carbolic acid; no tumour was felt during life; the infant was ten months old. Remember that renal tumours of congenital origin are frequently accompanied by other congenital abnormalities; in seven hundred post-mortem examinations in children I have found one kidney absent thrice.

The diagnosis of kidney tumour, as distinguished from enlargement of the liver and spleen, ovarian tumour, psoas abscess, or mesenteric swellings, is usually easy; I have not seen a case of primary malignant disease of the liver in a child.

There is but little to be done in renal sarcoma except to support the strength and relieve the symptoms. It is probably useless to remove the tumour, because when the kidney swelling is detected, secondary growths are almost inevitable, and the shock of the operation is ill-borne. (See a discussion "Is Surgery Justifiable?" in the "Medical Society's Transactions," Vol. x.) The treatment of hydronephrosis and pyonephrosis should be left to the surgeons; free drainage and antisepsis would perhaps in both cases be better than aspiration.

# CHAPTER XV.

## DISEASES OF THE NERVOUS SYSTEM.

### GENERAL CONSIDERATIONS.

Every human infant is born with a nervous system of such instability that it might be regarded as diseased, and would be so were it not for the universality of the affection. The new-born babe and the infant are then necessarily neurotic, and exhibit all the fluctuations of this temperament. The manifestations of it are seen in their motor restlessness (small movements—microkinesis), and in the irregularity of their pulse, respiration, temperature, and probably every other corporeal function. The part of the nervous system which grows the fastest and in which development is least complete naturally shows this instability most; the spinal cord is much better behaved, is quieter and more mannered than its undergrown, poorly-developed governor, the brain. Motion is more easily destroyed than sensation, and perfect mentation, perhaps, is more easily abolished than motion. A perpetuation of the infantile state produces the adult neurotic.

Any consideration of the nervous system would be incomplete, which left out of account, besides afferent and efferent impulses, the blood state, blood pressure, and other vascular conditions.

All that we can say, and all that we can mean about primary neurasthenia is that the nervous elements are most wrong, but how much wrong are the vascular and other conditions of life of the nerve tissues is not stated. Some cases of heart disease come first to the doctor with nothing but nervous symptoms; headache, giddiness, tremblings, shaking, either spontaneous or evoked by the slightest circumstances; and

there is danger of diagnosing primary neurasthenia unless systematic examination of the circulation be made. This is equally true of disease of the kidneys and other systems.

It is not adequately recognized that there are such things as neuroses complicating the symptoms, and sometimes being the only symptoms of organic nerve disease. There is no sphere of the nervous system in which these symptoms may not be. The question has indeed to be decided whether or not the symptoms of organic nerve disease are not themselves merely neuroses. At least it is astonishing how changeful are symptoms of true organic nervous disease. A child is brought with such symptoms as point to headache, with vomiting and with something wrong with its vision. The diagnosis of organic or "coarse" brain disease at once flashes before the mind, but a careful scrutiny may calmly satisfy the doctor that the symptoms are dependent on a neurosis, *e.g.*, megrim. Now what must be recognized is this: That coarse brain disease may make a clinical combination utterly indistinguishable from megrim or any other purely functional and recoverable affection.

Incessant violent vibration at the periphery of any nervous apparatus may derange the central action or bring it back to normal modes of work.

To be deeply impressed with the notion that all diseases result from a co-operation of causes, gives much hope in treatment. How many cases of chronic nerve disease may be ameliorated by remembering this doctrine? It is no exaggeration to say that it may have required a hundred causes to produce one morbid process, and that that morbid process cannot exist if one of the hundred causes be removed.

## HEADACHE.

To make a child's head ache after the cerebral cortex has become differentiated from the white matter, is probably

easier in inverse proportion to age — violent peripheral irritation is the most potent exciting cause; from the eye, *e.g.*, megrim, hypermetropia, and other errors of refraction; from the teeth, ears, nose, pharynx. A visit to the dentist after one to the oculist, then to the ear surgeon, rhinologist and laryngologist may be as scientific as the advice may seem amusing. Any blood condition may induce headache; anæmia, toxæmia from kidney or liver defects, indigestion, constipation, rheumatism, typhoid fever, and other acute specifics. Meningitis and cerebral tumours are not likely to be forgotten.

The diagnosis will rest on the associations of the headache. Errors of refraction are readily discovered by the ophthalmoscope; the headache is generally frontal and often supra-orbital; I have observed that headaches are more prone to occur in hypermetropics, myopics, and astigmatics even when there are other causes adequate to account for the headache—typhoid fever, indigestion, anæmia, over-work, or debility of any kind. This fact may be placed side by side with the observation of Dr. Gowers that optic neuritis from head disease (? other causes of neuritis also) is more prone to occur in eyes which are not emmetropic.

Megrim is irregularly or sometimes regularly periodic in its occurrence, like epilepsy and other neuroses; it is frequently hereditary on the maternal side; other neuropathic conditions may coexist in the family; fitful or recurrent vomiting is probably often of "megrimous" import or relationship.

The first step in the **treatment** of headache is to find out and remove or avoid the cause; in most cases a combination of causes coexists; is it not strange that the headache of cerebral tumour should be so variable even when the tumour is growing? See some remarks (p. 395) on the removal of symptoms by castor oil—symptoms which were undoubtedly associated with organic lesions; sometimes the

headache may be due to other causes in connection with the chief cause, but the chief cause may be insufficient at times to develop headache; the same considerations hold good of other intermittent symptoms.

Attention to the hygiene of the whole body indirectly improves the health of the nervous system; the art of preserving the health of the nervous system should be taken into special account—the removal of all irritations to the peripheral nerves of the skin, mucous membranes, teeth, nose, pharynx; the prevention of over-action of any part of the nervous system, especially of the cerebral cortex (over-study, emotional excitement, excessive noise, light, sunlight and heat, bad smells and tastes); the promotion of *perfect* action in every part of the nervous system, and especially of the cortex and walking apparatus, by regulated habits of work, exercise, play and *sleep*. It need hardly be said that any cause, intrinsic or extrinsic, that interferes in any way with the formation and oxygenation and depuration of blood must also be removed, avoided or overcome by whatever means may seem most adequate to the particular occasion. A large broad-brimmed straw hat is advisable if children have to go out into excessive sunlight and heat; a woollen cap may be used in the winter or cold weather, to keep the head at a comfortable and uniform temperature, and to ward off headaches.

Massage of the whole body is a very valuable agent in the promotion of the general health; it appears to have a sedative action on the whole nervous system when this is in a state of irritability which is always associated with debility; active manifestations are not, as a rule, signs of strength; voluminous discharges of energy are rarely the results of careful consideration.

Massage may be regarded as replacing exercise; everyone knows the sensation of satisfaction which attends muscular

motion when the body is healthy; a similar sensation is experienced after a neat and complete massage. The movements practised in total massage of the whole body are practically those described under Infantile Palsy (q.v.), but it is not possible to carry them all out efficiently on the trunk. The grand aim should be to squeeze and knead the muscle without injury to the cutaneous nerves; with a little practice, most intelligent people may be taught the necessary manipulations. Cold douches should be tried in severe cases of recurring headache of nervous origin.

Certain drugs are valuable: Arsenic, in small doses after meals for a few weeks, is certainly of considerable value as a nerve alterative and tonic; steel wine may be given with it if there is anæmia; strychnia and nitrate of pilocarpin may be tried.

Bromides of potassium, sodium, or ammonium are most useful during the attack, but may be prescribed in the intervals, in combination with stomachics, or alone, with a view to breaking the nervous habit.

Guarana may be given during the attack, ten grains of the powder in syrup of lemon ʒi. and chloroform water ʒss. for a child ten years old. The fluid extract is recommended, and it may be administered in syrup of orange ʒi. and water ʒiii. in a fifteen-minim dose to a child of the same age.

During the attack of megrim children are generally miserable, feel chilly, and every movement usually increases their distress; if the headache threatens in the morning at the time for rising they should be kept in bed with the blinds drawn—warmth, storage of force and recumbent posture are implied. A strong cup of tea or coffee may cut short or ward off a threatened attack; caffeine is the alkaloid in guarana; the alkaloids of tea and coffee are practically the same. I think also a saline purge is valuable, such as a solution of magnesic carbonate, or Friedrichshall, with

plenty of warm water to promote peristalsis, perspiration and circulation.

Sour-smelling breath should be a sign for inducing emesis, even if emesis have occurred as part of the megrim. Warm water, with a little mustard, is best; a little mustard because some of these children are very easily made to vomit. In pure neurosal headache, the pain may be sometimes prevented by local applications of hot or cold water, by means of Leiter's tubes or Thornton's ice-cap; this does not as a rule lead to increased frequency of attacks. Puberty or pregnancy may cure a headache, as it may cure any other nervous symptom; very rarely headaches become worse at puberty and for a long time afterwards.

## NEUROTIC CHILDREN.

A child may be nervous without having any definite nerve affection; a sort of nervous common ground exists from which any nervous affection may start.

The phenomena or marks of this nervousness are restlessness, twitching of small muscles, as of face and hands, sudden depression, sudden excitement and explosive modes of working or doing anything; the child may be easily made to laugh or to cry; the transition of mental states is too abrupt—judged by the normal standard; the child may be too clever, and is often dramatic; unnaturally bright at one moment, preternaturally dull at another; profoundly influenced by ordinary changes in its physical or mental environments. The diagnostic value of twitching fingers and face and constant restlessness is great.

This nervousness may he inherited from one or both parents, or it may be acquired from physical defects, or from less material causes: defective digestion, bad feeding, bad clothing, inattention to the bowels and skin, may develop nervousness, or it may be "school-made" from over-study

and competition; it may develop suddenly from fright or terror; scarlet fever often makes it; typhoid fever may abolish it; rheumatism may cause it to be inherited, or may even make it; rickets is a powerful cause of nervousness and neuroses.

Children with a functional nerve disease are usually, but not always, nervous, *i.e.*, sometimes the mental region of the cerebral cortex is stable, and other regions less so. An organic lesion of the brain, whether stationary or transient, is usually attended with nervousness; hysteria and organic brain or cord disease may go together.

The etiology gives the cue to **treatment.** These cases may easily leave the common ground and move off into special spheres; prevention is therefore better than cure, an armed neutrality, with strong defence at every weak point. Over-study may tell, curiously enough, not on the brain but on the bowel, or over-study may develop enuresis. The diet, clothing, exercise, education, play, work, everything in the internal and external environment require consideration. It is strange that a piece of work which one time will completely upset the nervous system may at another leave it untouched; this remarkable resistance seldom occurs, but it is an encouragement; it proves that the nervous nutrition can be got to if it cannot be retained at the "sticking" place.

Besides prophylaxis and hygiene, other treatment of tonic, specific and sedative description may be tried.

Iron and arsenic are invaluable tonics: vinum ferri or any of the well-known syrups may be given; some object to the syrups as provocative of acetous or lactic fermentations; in the doses usually prescribed I have not noticed this inconvenience; cod-liver oil is often needed and frequently well borne. Stimulants with meals may do good; stout, claret, wine or beer may be useful in different cases. Maltine frequently causes biliousness if given in too large doses.

Pepsin in five-grain doses to a child of five may improve gastric digestion.

The bromides and chloral may be given three times a day, or better in a single nocturnal dose; they may be combined, often with advantage; five grains of chloral and five of bromide in syrup 3i., Aq. ℥ss., may procure a good night's sleep, free from restlessness, in a child of three.

Hydrobromic acid ♏x., syrup ♏x., Aq. 3i., is preferred by some.

Trial may be made of nitrate of pilocarpin in doses of $\frac{1}{100}$ of a grain, gradually increased; or antipyrin in 5 grain doses.

The necessity for regulating and daily evacuating the bowels is great; to use purges every day may not be advisable, but a course of purgation lasting three weeks or so may break the habit of constipation and may cause the nervous apparatus to revert to a healthier action.

## PULSE AND RESPIRATION.

These subjects are considered here because of their important relation to the nervous system: the pulse and respiration in infancy, like the other nervous actions of infants, are remarkably frequent, irregular, and easily disturbed or irritable.

The number of heart beats at birth is about 150, but their number is liable to great fluctuations; the number per minute is generally above 100 during the first year, and about 100 during the second and third years; ninety is a common number after the third year, eighty after the fifth, and seventy after the tenth; but these are by no means constant. Trivial peripheral impressions may pervert the rhythm of pulse and respiration or the centres themselves seem sometimes to go wrong of themselves. Compare these actions with other infantile actions and with the actions of neurotics. Sleep nearly always lessens the frequency of the pulse, even a minute disturbance in any part of the organism may throw both the rhythm of the pulse and that of breathing out of its usual condition.

**Croaking respiration** is mentioned here because it partly depends on a spasmodic neuro-muscular element. I have

already referred to the shape of the epiglottis in infancy (p. 139). The croaking is usually inspiratory, but occasionally expiratory also; is deeper toned than the sound of "crowing" inspiration; is most common in female infants; is congenital for the most part, and always present; it is less marked during sleep, and after the administration of chloroform as a rule; usually remains with the child for many months, and may do so for two or three years; as a rule the children grow out of it in time; it is not generally attended with signs of obstruction to the entrance of air. Though the infants are usually debilitated, it does not seem to shorten existence or to be in any noticeable degree injurious to their health. Indigestion, catarrhs and other slight ailments may increase its intensity, and perhaps prolong its existence. Dr. Gee has described many cases in the Bartholomew's Hospital Reports, and Dr. Lees regards the condition as sometimes at least dependent on an increase in the normal incurvation of the epiglottis ("Path. Trans.," Vol. xxxiv.).

The **treatment** should be hygienic and dietetic, with regulation of the functions of the bowels and skin as described in Chapters II. and III. The clothing of the infant should be carried out on the lines already laid down; it is very important to correct anything wrong with the atmosphere, bowels and digestion; tonics of cod-liver oil and iron may be prescribed in minute doses; frequent exposure to fresh air for a few minutes is sometimes the best tonic.

Treatment does not, as a rule, influence the condition very much, though, as has been mentioned, transient disturbances either in the health or surroundings of the infant make the croaking more marked.

**Large mammæ** secreting a milky fluid in new-born infants may occur in either sex; their presence should probably be ascribed to perverted trophic nervous influences; the tension and swelling of the glands sometimes threatens to terminate

in actual inflammation; both breasts are usually affected, but one more than the other; the size attained is rarely greater than half a small Tangerine orange.

The **treatment** consists in preventing local irritation, and in soothing the nervous system by strict attention to the hygiene, diet and bowels by the ordinary means elsewhere described. The milk may be drawn off by the breast pump if necessary, but warm moist fomentations and painting with glycerine and belladonna usually rapidly abate the irritation and swelling.

### DISORDERS ASSOCIATED WITH TEETHING.

An infant being necessarily a neurotic is very susceptible to any stimulus or change, either in its internal or external environment. Owing to the want of development of the nervous system a disturbance arising at any part of it is propagated along whole tracts of nervous tissue in indiscriminate fashion, the result probably of want of that inhibition which the cerebral cortex eventually comes to exercise over the whole of the lower centres. Admit that morbid processes may occur at the site of the dental follicles and may lead reflexly to disturbances at other parts of the nervous system; but confess that cases of derangement or disease are attributed to disorder of dentition, when it is clear that the gums and teeth are sound, and that the diet, clothing, or some other part of the surroundings of the infant is at fault; and allow that normal dentition cannot produce symptoms of disease. Imperfections in feeding and other hygienic defects may make an active process like that of dentition step beyond its normal limits with corresponding disturbances in the system. It need not be that abnormal processes in the dental follicles should reveal themselves by local changes in the gums.

Occupation enough will be found in steering clear of various derangements and their consequences which accompany

dentition, but the use of the lancet in these cases should be restricted to a very small sphere. If there be obvious tension, swelling and redness at one part, the scarification and local depletion with the lancet may serve, at least partially, to relieve reflex irritation and local morbid sensation. Even a blue gum evidently swollen, and often fluctuating as in some congenital syphilitics, may produce no symptoms—the lancet put into this sac may turn out a necrosed enamel crown.

*Teething, like worms, may cause any nervous symptom and is credited with the power of producing simple stomatitis, ulcerative stomatitis, diarrhœa, bronchitis, vomiting, otitis, squinting, convulsions, laryngismus stridulus, erythemata, eczema* and attacks of *fever* of *irregular type.* Infantile paralysis, probably, has almost nothing to do with dentition. A combination of fever with squinting or convulsions may suggest *brain disease,* or of erythemata with fever an acute specific fever, but only an alarmist would not first think of functional disorder as sufficient to produce both combinations. It does not always follow that the disappearance of pyrexia and of squinting after the administration of a dose of castor oil *proves* that constipation (which is rare from teething), fever, and squinting were simply functional. I have seen at least one case, in an infant 15 months old, in whom there was this combination of symptoms, relieved by castor oil, but in which the subsequent history showed that meningeal disturbance may have had at least some share in the causation of the symptoms. The child died of tubercular meningitis ten days from the first appearance of symptoms; the constipation, fever and squinting certainly passed away for 24 hours after a teaspoonful of castor oil. A gray powder, castor oil, or rhubarb and soda will generally remove fever associated with dentition.

The second remedy will also effect considerable improvement in dentition diarrhœa, though attention must be directed to the diet; the

stools are not greatly changed from the normal in the pure dentition diarrhœa; they are not offensive, and contain, as a rule, no obvious slime; the curd is less digested. The infant whilst teething must be protected from chill either of the chest or the belly; this is requisite still more in summer and autumn than in winter and spring, for the reason that in the latter periods parents are particularly careful about the avoidance of cold and damp. The chest and belly should be uniformly protected, and the clothing changed in accordance with the state of the weather, which is liable to remarkable diurnal and nocturnal variations, in the autumn especially. Vigier has rubbed the gums in disordered dentition several times daily with a syrup of cocaine—two grains of the hydrochlorate with ten drops of tincture of saffron, and three drams of syrup; it should not be allowed to be swallowed; for the further treatment of the maladies attributed to dentition, consult the various articles.

The **period of second dentition** is one which is liable to be attended with *nervous* and *digestive* troubles; in most cases of the kind there will generally be found, on careful inquiry and examination, to be other causes at work, either in the form of excessive study, a nervous defect of constitution, over-eating, insufficient exercise and fresh air, inattention to the bowels, and the like. Simple attention to the hygiene of childhood may remove most of the simple troubles that seem in any way to be related to the development and appearance of the permanent set of teeth. In the same family one child at the second dentition may develop chorea, another bandy legs, another rheumatic arthritis.

"**Night terrors**" are, in my view, a species of reflex cortical epilepsy; they may be readily controlled and caused to disappear in the vast majority of cases by systematic attention to hygiene, and by the administration for a week or two of some simple mixture like this:—

℞ Pulv. Rhei. gr. iii.
Pulv. Sodæ Bicarb., gr. vi.
Magn. Sulph., gr. vi.
Syr. Zingib., ℥xx.
Aq. Menth. Pip., ʒiii. t.d.s.

for a child seven years old, which removes irritation from the vagus and splanchnic regions and perhaps substitutes a tonic form of stimulation to the same nerves as well as altering the action of the liver and other viscera.

Sometimes add Am. Brom. gr. ii. or Chloral gr. ii. if the child seem nervous and excitable during waking hours. The most important hygienic item is the diet, which should be restricted all round, but especially in the matter of pastry, puddings, pies, potatoes, pork, and sugary or starchy food generally. Interdict the use of tea and coffee except in the form of a "make believe;" cheese and beer of course are forbidden, together with any cakes or preserved fruit. If the child had fits during the first dentition, or if it has suffered from other neurotic manifestations, or there be a neuropathic heredity, then, doubtless, the "night terror" is more largely due to the central nerve irritability than to the peripheral, digestive, or other disturbance. A vegetable diet, a diabetic diet, a pure milk diet for a few days and many other methods may be tried sometimes with wonderful success in obstinate cases.

**Bad temper** is a pathological equivalent of night terrors, headaches, chorea, and other neuroses; the treatment is the same as in these affections.

**Rheumatic children** are often of neuropathic tendency; they are frequently the subject of night terrors or nightmares at the climacteric periods; they are liable to lientery and enuresis. The treatment of their complaints may take place in one of two or in both directions; sedatives to lessen the irritability and anti-rheumatics to act directly against a considerable percentage cause of the irritability—bromides, chloral, and opium on the one hand; salicylates of soda, lithia, quinine on the other.

"**Dentition cough.**"—During both periods of dentition there may be a cough which appears to be almost entirely of

neurotic origin, *i.e.*, due to over-activity of the respiratory centres, the exciting causes being so slight that they can hardly be more than the usual stimuli constantly acting on the centripetal terminations of the respiratory centres. It should not be forgotten that a mere temporary change in quality or quantity of blood circulating in the respiratory centres may be the actual exciting cause of cough.

"**Puberty cough.**"—About the period of puberty, especially in boys, there often persists for months a remarkably bass and barking cough; it is in some way related to the commotion attendant on the accession of adult life.

For either of these coughs a course of tonics or sedatives is the treatment; the hygiene, diet, exercise, sleep and bathing should be regulated.

**Eruption of Teeth.**—There should be twenty milk teeth in the jaws at the termination of the second year; the order and time of appearance is thus schematically represented:—

| | 1 | 2 | 4 | 3 | 5 |
|---|---|---|---|---|---|
| | c.i. | l.i. | c. | m. | 2nd m. |
| Months | 7 | 9 | 18 | 12 | 24 |

The first teeth in the permanent set (of thirty-two) to appear are the first molars at the age of seven years or before:—

| | c.i. | l.i. | c. | bic. 1.2 | mol. 1.2 | wisdom. |
|---|---|---|---|---|---|---|
| Years | 8 | 9 | 12 | 10-11 | 7-14 | adult. |

As a rule in both sets the lower ones come first; the variation, especially in the first set, is often very great; rickets notoriously delays the appearance of the teeth; tubercle does not.

## RAYNAUD'S DISEASE.—SYMMETRICAL GANGRENE OF EXTREMITIES.—LOCAL ASPHYXIA.

This disease is most likely due to spasm of the arterioles, instigated through the agency of the spinal vasomotor centres. Accept not the peripheral neuritis pathology of the disease. The probabilities are that the vasomotor agency may be set in action from the brain, cord, and nerves after the fashion of

any other nervous action and under the influence of any peripheral or central irritation. Doubtless a condition resembling in some respects Raynaud's disease may complicate any organic nervous disease, *e.g.*, hydrocephalus, but that is very different indeed to the sudden fits or paroxysms of local asphyxia. Like paroxysmal hæmatinuria, with which it may be associated in the same child, and in the same attack, it is distinctly related to cold, which can frequently, when artificially applied, induce an attack of the disease. Intermittent hæmatinuria might be regarded as asphyxia of the kidneys, resulting from spasm of the renal arterioles; usually there is little or no fever; the affection is frequently symmetrical in both feet, both hands, or both ears; sometimes the tip of the nose is the seat of the "asphyxia," or it may occur in disseminated areas in the skin. The affected parts suddenly or rapidly become intensely purple violet in colour, and may as rapidly clear away without gangrene following.

The amount of the gangrene when it occurs is very variable. Pain is always very great even without gangrene; there is usually tenderness also of the parts involved; the duration of the attack varies, but is usually at least some hours.

The urine may be porter-coloured once only from the hæmatinuria. The *diagnosis* is not difficult after the child has had one attack; at first embolism might be thought of and the heart should be examined. The **treatment** is to keep the parts warm and well protected during the winter months; the disease may occur in full bloom during the summer months; cold and damp should be avoided both outdoors and in the house; sufficient exercise to keep up a glow tends to ward off the attacks. *Friction* of the feet with cold water has seemed to shorten the attacks. The descending galvanic current along the spine and to the affected extremities may be tried daily and continued all through

the cold weather; the positive pole should be put to the back of the neck, and the negative used to stroke the skin below. In applying electricity to the extremities the positive pole may be put over the sacrum, and the negative moved about all over the legs. Care should be taken that the nervous energy is not too freely expended by emotional excitement or over-education. The pain should be relieved if necessary by opium, or bromides, or chloral, as well as by the local treatment above given. The clothing is a most necessary consideration; a flannel binder besides should protect the belly in hæmatinuria. Strychnia and sweating doses of nitrate of pilocarpine deserve further trial.

Appetite and digestion need attention; massage both of the parts most liable to be affected and of the whole body is certainly valuable.

## TETANY.

Tetany like laryngismus stridulus in young infants is mostly associated with rickets. The painful tonic contraction may affect one hand or one hand and foot on the same side, or commonly both hands and feet. The hand becomes cone-shaped—accoucheur's hand—the thumb is drawn across the palm, extended, not flexed; the fingers are frequently straight but semi-flexed on the metacarpus—called "interosseal position" because due to the action of the interossei.

The foot may be over-arched and apparently shortened; the spasm does not usually vary much from moment to moment; there may be slight swelling and redness on the dorsum of the affected foot and hand; this has been called "rheumatic" by the Germans.

Sometimes the tonic spasm spreads up the limbs, and may affect, so it is said, all the muscles, and even those supplied by the motor part of the fifth nerve. The facial muscles are always over-irritable; a tap or stroke with pen or finger causes contraction of the orbicularis of the mouth or eye, or

of the zygomatic and nasal muscles; a tap on the nerve trunk is most effectual. Pressure on the bracial artery and nerves may suspend spasm or induce it; the spasm continues under anæsthesia and during sleep; facial irritability is not confined to this malady. Laryngismus and ordinary convulsions may be associated with tetany.

**Treatment.**—No known drug has any certain influence over tetany itself; chloral gr. i., bromide of potassium gr. ii., calabar bean gr. $\frac{1}{30}$ increased to gr. $\frac{1}{3}$ may be tried three times a day. Try belladonna tincture in five-minim doses three times a day for a child twelve months old. The galvanic current is decidedly beneficial in some cases, and massage should be tried; the positive pole is fixed at the back of the sacrum or neck, and the negative stroked up and down the affected limb. Always wrap the hands and feet up in cotton wool. The treatment of tetany in infants is the treatment of indigestion and rickets (q.v.); the hygienic treatment is everything; the skin should be bathed regularly and kept clean. No drug has much influence on the spasm, which may last only an hour or two, but more often three or four days, and is prone to recur in the same child.

**Tetany at puberty** occurs in neurotic girls; it commonly affects only one hand; the pain is often great; spasm is frequently of short duration, apt to recur. Paralysis and amyotrophy have very rarely followed the tetany. The hand or part affected should be kept warm. Specially lined gloves may be worn, or the hand may be enveloped in cotton wool and a bandage; the bowels are often confined; facial irritability is rarer than in infants; fright and emotions should be avoided. Drugs appear to have some influence; the best during the attack is bromide of ammonium in ten-grain doses three times a day. At the same time exercise in the open air, daily bathing or cold douches, regulation of regimen and bowels with a course of steel wine and liquor arsenicalis may be ordered. Fresh food, as opposed to stale, salty, or preserved, should be eaten; and schooling should cease for a time. The spasm is possibly dependent on discharge from the spinal centres, seeing that sleep and

anæsthesia have no effect on it; its pathology is not certainly known.

## CONVULSIONS.

Convulsions require much more study than has hitherto fallen to their lot. Does a tonic-clonic sequence always prove that the cerebral cortex leads off in the violent nerve discharge? In new-born babies and during the first months of life, before the white is differentiated from the grey matter, the regular commencement of the motor part of the fit with tonic spasm and the regular sequence—tonic-clonic—may not obtain. Recognize no essential difference between convulsions, epileptic fits, eclampsia, and epileptiform seizures.

The causes of convulsions are innumerable, if details are to be given. Any disease of the nervous system, actual or potential, any irritation of its centres or peripheral terminations, may cause a fit. Rickets makes fits by increasing the explosibility of the nervous centres and by peripheral irritation chiefly in the intestinal nerve endings. Fevers and chronic toxæmias are potent excitants.

In convulsions, the tonic spasm of the hand usually causes flexion, the thumb being turned into the palm and clenched by the fingers; it is difficult to say whether consciousness is lost or not in infants; if the conjunctiva is touched and no spasm of the orbicularis prevents, it is assumed that there is loss of consciousness. An ordinary convulsion is essentially an epileptic fit, though there may be an organic cause. Local convulsions are highly important signs, but only if they be repeated, or if the convulsion spreads from limb to limb in a definite manner, say from face to arm, then to leg and trunk. The hand movements appear to be practically represented only in the opposite hemisphere, and destruction of the cortical mechanism causes permanent volitional paralysis of the hand; this is less true the younger the infant is.

The left cortex discharges the right side of the body. Horsley's experiments show that left cortical discharges may fire off right cortical centres through the corpus callosum; in hemichorea, the trunk muscles are affected frequently on the opposite side; the trunk centres of opposite sides are nearer to one another in the cortex of the brain; is this the explanation? Horsley states that electrical stimulation of one lateral column of the cord in monkeys does not cause spasm of both legs. Why not, if the spinal centres are so closely connected?

The **treatment** of convulsions is to diagnose the chief cause. A warm bath at a temperature of 90° F., with cold sponging of head, is very well for the nonce. Rickets, worms, the gums and ears must be remembered. The lancet may be used if the gum is hyperæmic and tense; it seldom prevents the recurrence of convulsions. The ear may be inspected with the speculum, under chloroform, if it be suspected; a leech to the concha and hot fomentations may relieve pain; incision of the membrana tympani is the best treatment if otitis is apparent; the single incision into the membrana tympani readily heals. If there is an escape of matter or serum, pain, and perhaps convulsions, may cease at once; if there is no effusion the bleeding caused by the incision often affords an effectual relief. In all convulsions and epilepsies the stomach and bowels should be emptied. An enema of soap and water may empty the rectum and may bring away thread worms.

The child should lie in the recumbent posture, and every care taken by loosening the clothes to prevent obstruction to the respiration; the mouth should be inspected, and the throat kept clear; plenty of fresh air should be supplied; the teeth should be prevented from biting the tongue by placing a piece of cork or the padded handle of a spoon between the jaws.

Sedatives may be required; chloral gr. v., bromide of ammonium gr. v., may be given and repeated; they may be dissolved in warm water and injected into the rectum; two grains of chloral and six of bromide for a child twelve months old.

Sequent exhaustion and paralysis should be treated by rest and brandy in ten-drop doses, repeated as may be necessary; or a little strychnia, which curiously does not in minute doses appear to provoke spasm.

One infant aged twelve months is taking a minim and a half of liquoris strychninæ three times a day.

## EPILEPSY AND MEGRIM.

Epileptic children often have had convulsions during the first dentition; there is no essential difference between eclampsia and universal motor epilepsy; epilepsy is characterized by recurrence of fits; it chiefly depends on inherent instability of the motor, sensory, and mental centres; motor symptoms are rarely present alone; loss of consciousness is probably dependent first on the widespread character of the cortical discharge, secondly on its intensity; a voluminous and rapid discharge would probably cause instantaneous loss of consciousness; sometimes the intelligence is only diminished, or it may be exaggerated or perverted; megrim is an epilepsy of the sensory cortical centres.

Epilepsy is always, or is attended with, a cortical discharge. The discharge may commence in the pons and medulla; it does not signify whether the discharge is due to vasomotor spasm or to vasomotor dilatation; the discharge is the epilepsy; it is impossible to say whether the vascular state is primary or secondary.

A flash of light before the eyes—a coloured spot or a white-coloured spot—indicates a discharge in a spot in the visual apparatus; it is a very limited epilepsy; it may be due to

toxæmia the result of "biliousness;" but it is a nerve discharge all the same. The same arguments apply to sudden and total loss of sight which occurs in children who have at other times a full epilepsy with motor spasm of tonic-clonic sequence.

Ordinary **megrim** is not unfrequent in male children of neurotic type; the headache is not always severe, and is not always hemicranial. Vomiting and a sense of misery are common symptoms. Teichopsia, coloured vision, glimmerings, and diffuse lighting up of momentary character, are probably due to discharges of varying intensity in the cortical visual centres.

Epilepsy or megrim may be purely mental or these mental explosions may be complicated with sensory and motor disorders. A feeling of infinity or chaos, of enormous proportions or microscopic dimensions, a sense of hopeless calculation or task (Gee), lasting a short time and repeated at irregular or regular intervals, are perversions of normal brain currents, more or less explosive developments of energy in the cortical perceptive centres.

Biting the tongue, passing urine and fæces are evidences of total epilepsy or convulsions; there is no function of the body which may not be disturbed, from complex mind operations down to simple acts of secretion; fear and joy, spasm, salivation, palpitation, defæcation, micturition, priapism, &c., &c., may be due to explosive nerve discharges.

Speaking generally, megrim is in its physiological aspect, a more continuous, less violent nerve discharge than occurs in epilepsy. Perversions of tactile sense and of muscular sense are not unfrequent; the limbs may feel as heavy as lead or as light as a feather; there may be inco-ordination of movement; the child may not know in what position his limbs are when his eyes are shut (impaired muscular sense).

In the **treatment** of epilepsy nothing is more important

than the exercise of those discretions which preserve the nervous health as contrasted with the health of other systems. Feeding, ventilation, clothing, bathing, exercise, regulation of digestion, of sleep, and of bowels all require attention. Probably there is an epileptogenous zone at the periphery of the nervous system in most cases of epilepsy; the region in which an aura occurs may be the epileptogenous zone. The epigastric aura—a feeling of sickness, faintness or hunger—is common; in these cases the importance of attending to the food, digestion and bowels is immense. Careful regulation of the diet and a mixture of rhubarb and soda, daily exercise in the fresh air, will often cause the epilepsy to disappear for months together. The stopping of a fit, when the aura commences in the periphery of an extremity, by placing a tight bandage above the seat of the aura, or by simply grasping the limb, seems to me an argument in favour of the above view, as does also the treatment of epilepsy by counter-irritation and setons. The treatment of an epileptic fit is the same as that for convulsions (p. 403).

In the intervals, if hygiene be insufficient to prevent their recurrence, medicines may be used. Tonics and sedatives are the chief agents. Cod-liver oil and steel wine are of great value. It is most important to procure proper sleep at regular hours. These children are some of those whose position in regard to the magnetic meridian makes the difference between sleep and the want of sleep. Cold feet should be prevented, for they may keep the child awake. Hot and cold water applied alternately, and rapidly followed by friction and covering the feet up in cotton wool gloves, is generally effectual in most cases.

The bromides are the best sedatives; they may be administered in different ways to suit different cases; some cases are best controlled by giving, say, five or ten grains of the sodic or potassic salt three times a day in glycerine

(mxx.) and water; or the bromide may be given in the stomach remedy—Mist. Gent. Alk. or Rhei c. Soda. Not unfrequently a half-dram dose of bromide of ammonium, given at night time, with twenty drops of glycerine and Spt. Ammon. Aromat. in an ounce of water, does most good; or a smaller dose may suffice. Sometimes the single dose method answers best when given in the early morning. If the fit occurs at night time the single dose nocturnally is very valuable. The frequency of repeating the dose must vary in different cases; it is well to suspend the bromide for a time and to resume it later; the effect is often greater in this method of administration. Still, a bromide course should last six months in bad cases.

Some caution is necessary with bromides, especially in young infants, in whom even minute doses may cause plaques of cutaneous induration with sebaceous or suppurative looking points; in older children the acneform pustules may result as in adults; these effects are not always prevented by combining the bromide with liquor arsenicalis or sodæ arsenitis and belladonna; sometimes the long continued use of bromides leads to physical and mental debility.

Liq. Arsenic mii. may be given with steel wine ʒii. t.d.s. either alone or during the intervals of suspension of bromides.

As a rule stimulants should be avoided altogether; much nitrogenous animal food has been found sometimes to increase epilepsy; white fish, poultry, game, fresh vegetables, and milk may be allowed, but meat and eggs should be given sparingly; an exclusive milk or vegetable diet may be tried for a week or so. Sudden journeys into the country for a day or two sometimes do the nerve cells good.

An important part of the *hygiology* of the nervous system is the prevention of injuries from falls and blows, especially on the head. Tumours, epilepsy and chorea are often

ascribed to such causes. Fright and terror, however induced, are prone to derange motor, sensory and the perceptive apparatus. A fit of fright or terror is indeed to be regarded as a kind of cortical epilepsy attended with violent discharge of energy, and accompanied by great derangement of intellect or even total loss of consciousness; it is true that epileptics and neurotics are often easly frightened or terrified; the damage resulting must be injurious all the same. Everywhere in the body, but especially in the nervous system, *habit* is observed. In childhood *habit*, which is unconscious or second nature, is easily established, less easily broken; *habits* may often be got rid of at climacteric periods —second dentition and puberty. The prevention of fits is seen to be necessary from such considerations concerning habit; not for these reasons alone; frequently repeated epilepsy has other consequences than imperfect mentation, it leads to imperfect development of the brain, and sometimes to physical defects, such as excessive growth or undergrowth of the skeleton, or to excess of flesh—polysarcia. How, is another matter: possibly these changes result from repeated congestions, but more likely from direct disorder of nutrition of brain and nerve. It is petit mal that impairs the intellect most; petit mal being epilepsy of the intellect, not of the motor apparatus, probably explains its malign influence on mentation.

Epilepsy not always congenital is often associated with an organic causation; a large scar or atrophy of the brain (porencephaly) may be the cause.

The education of epileptics requires assiduous attention. Frequent fits should be an argument for stopping systematic schooling of the competitive character; the child should be taught control; he cannot control convulsions; but he may be taught to avoid excited gesticulation, too animated discussion, or too rapid speaking and thinking. There are two

ways of performing neuro-muscular acts, or in other words of discharging some and inhibiting other nervous centres; the performance may be done violently or quietly; either method may effect the purpose in view effectively and perfectly well. The former or emotional method necessitates the display or discharge of a voluminous amount of energy; the latter, equally effective, often undemonstrative, and certainly most artistic, uses up no more nerve force than is absolutely necessary, and consequently is but little exhausting. As there are two ways of performing neuro-muscular acts, so there are two types of temperament. The one rapidly tires from work, the other is but slowly exhausted. The effect of each act, mental or muscular, is precisely the same in each, so far as the attainment of its real object is concerned. Who can doubt as to the method to be inculcated, the temperament (if possible) to be acquired?

The maintenance of health by every means at our disposal is a hygienic consideration that is common to nearly all disease. There are few diseases which are predisposed to by perfect health. Typhoid fever is said to be one, and scarlet fever another. Diseases are, however, always more easily dispersed when the body was previously healthy. A mere lowering of vitality favours epilepsy in neurotic children. A defect in liver, a temporary inadequacy in the kidneys, skin, or lungs may increase and maintain epilepsy in neurotic children. The same considerations apply, indeed, all round the nervous system. Isolation of application is like force brought to bear at one point it seems more powerful, proves often more striking.

It is not a good thing for epileptic children to have "children's complaints"—measles, hooping cough, and the like. These diseases may secure permanence for epilepsy which might otherwise have departed; they may do this in many ways, but chiefly two—by toxæmia and by

cerebral extravasation; the latter cause need not be extensive; good grounds exist for believing that epilepsy has been started in a small hæmorrhage (with sequent scarring of brain), the outcome of a hooping paroxysm or of blood diseases.

Whether masturbation is a cause of epilepsy is doubtful; there can be no doubt of its injurious effect, and of the proneness to practise it on the part of children with defective brains. Circumcision should always be practised. It may be necessary to make the genitals so sore by blistering fluids that pain results from attempts to rub the parts. All local causes of irritation should first be removed and weak mercurial ointments or glycerine of belladonna should be used to allay any local morbid sensation.

*Simulated* epilepsy may be met with; true opisthotonos almost never occurs, and the conjunctival test is mostly absent; the tongue is not bitten, nor the clothes dirtied; stupor seldom succeeds to the paroxysm, which is made up chiefly of co-ordinated contortions of the countenance and limbs; fixation of the chest to the cyanotic point is not seen; some cases are certainly co-ordinate convulsions of hystero-epileptic type; a smart shock of the faradic or constant current commonly cures the case.

Epilepsy may occur at night time without recognition; wetting the bed is usually a nerve discharge limited to the spinal lumbar centre for micturition; enuresis, however, may mean nocturnal epilepsy, and be the only obtainable evidence of it.

*Cutaneous reflex epilepsy* deserves one word; it is like the artificial epilepsy of guinea-pigs; the only case known to me is that of Hughlings Jackson; it was that of a boy aged seven, in whom a "fit" or "fall," with cessation of respiration and conjugate deviation of eyes and probable unconsciousness, were induced whenever any part of the head

was unexpectedly and lightly touched; in this case there was a permanent lesion somewhere in the motor apparatus of the brain, for there was persistent left hemiplegia with some want of development of the arm and leg; the fall seems to be a resolution of the limbs, an emptying of the nerve cells of their energy or an absence of discharge from them.

Epilepsy may pervert the morals as well as the intellect of the child; his education should be directed to improve both and to prevent so far as possible their deterioration; his every caprice should not be indulged; he should be taught, without undue harshness or severity, to recognize authority.

Many circumstances or conditions often improve epilepsy for a time; and sometimes, indeed, the change, whatever it is, increases the frequency of fits. Change of occupation, of scene, of diet, sudden excitement of a joyous or depressing kind, are such circumstances.

Want of occupation, idleness, is not good for epileptics; their mental centres should be interested and amused by measures which do not strain the intellect or exhaust the energy; play is good for them; the fits occur less frequently whilst thoroughly engaged in any pursuit; perhaps this may be because they only play or occupy themselves when their nervous system is at its best.

Gymnastic exercises are certainly useful in epilepsy; the nutrition of the motor centres may be thereby promoted. Occupations which involve muscular movements as well as mental exercise should be enjoined—gardening, carpentering, tending to animals. Defective articulation, slouching gait and awkward manners may be mended by the systematic use of the articulatory apparatus and voice and other motor mechanisms, as by singing and drilling.

Epileptics often learn to sing fairly, and the Solfeggi system offers a valuable method of instruction as well as amusement;

they often make fairly efficient performers in school bands; the strict control and regulation of the voluntary movements inculcated by drill and singing must be of great value, and probably directly stirs for good the nutrition of the motor and sensory nerve centres. The awkward movements may be due quite as much to defective muscle sense as to motor inco-ordination.

The child should be happy, for happiness induces better action, and physiological hyperæmia, of the cortical centres; such a state must tend to help a return to health. The child should not be educated side by side with the healthy, for he will be led to feel his inequality, which may make him miserable. He should be taught with others who are as nearly as possible of the same intellectual level with himself. The education, amusements and diet of those classed together being the same, there will be less room for jealousy, which is often a prominent emotion in epileptics and backward children. *Purging* systematically has been practised for epilepsy; it is nearly always valueless; the bowels should be regularly opened by simple aperients if there is habitual constipation.

Some have advised the application of a leech to the head to ward off an impending attack.

Setons and blisters (counter-irritation acting by "inhibition") kept open for a long time are not much in fashion now, but in some cases they may be useful.

Tincture of *belladonna* alone has done good in some cases, but it acts best in combination with *bromides;* it may be thus freely pushed in cases that have resisted bromides; some advise long continued small doses; it is of most value in cases of petit mal; five minims of the tincture may be given with ten grains of bromide of potassium, t.d.s. The *nitrites* have been used in epilepsy, but are not of conspicuous value except in some cases; nitrite of Amyle may be inhaled in two-drop doses, or given in one-drop doses in syrup or mucilage, for a child of seven; nitrite of sodium may be given in ten-grain doses three times a day; nitro-glycerine (trinitrine), in $\frac{1}{100}$ grain doses, either half a choco-

late tablet or the one-per-cent. alcoholic solution; they may be used to cut short an attack or to prevent recurrence of fits.

Silver and zinc have also been used; oxide of silver gr. $\frac{1}{2}$, nitrate of silver gr. $\frac{1}{6}$, zinc oxide gr. iii. (the most useful of all), sulphate of zinc gr. i.; they seldom succeed where the bromides fail; these may be given three times a day for children seven years old, and an hour or so after meals.

Musk and valerian are other remedies; they are most useful when hysteria is present; for the mode of administration see Chorea. Osmate of potassium in gr. $\frac{1}{100}$ doses has been employed alone, and with bromides in children seven years old; the treatment of megrim is given under "Headache."

Dr. Gowers has employed borax with success in children; the dose should not be large to commence with (gr. $\frac{1}{8}$), and should not go beyond two grains t.d.s.; it may cause psoriasis when continued for months; arsenic causes the psoriasis to disappear. Digitalis may be used alone or in combination with bromides. For a discussion of its mode of action, and indeed for information concerning the action of remedies generally in epilepsy, the reader should consult Dr. Gowers' work on epilepsy. Digitalis is certainly useful in cases where there is a feeble circulation, and the heart palpitates on the slightest cause; the tincture may be given in two-drop doses with bromide of potassium gr. x. for a child seven years old, or it may be combined with the single nocturnal doses; its effect should be carefully watched.

## INSANITY

Occurs in children especially of neurotic families; it may be associated with structural defects of brain, or be a pure neurosis.

Melancholia may lead to wilful starvation, emaciation and death; attacks of mania may occur; recurrent passions, fits of ill-temper without adequate cause should be regarded as mental epilepsies which diminish the intelligence. Children may become unusually suspicious of the movements of people about them; they may imagine themselves the object of every whispering conversation; a degree of snappishness is often the prelude to further symptoms.

The periods of second dentition and puberty are the times

when mental disease is most prone to occur. Stammering may occur at these periods; it seldom or never occurs before the period of second dentition.

Masturbation and insanity may go together, and each increases the other. For children the offspring of neurotic parents or alcoholic progenitors great care is necessary at all times to prevent their breakdown, but especially at the climacteric periods of dentition and puberty; they should not do the regulation amount of brain work. They should be treated as indicated under the head of "Neurotic Children;" the asylum may rarely be necessary. At these epochs the speech may be lost altogether for a time, and have to be slowly regained; speech may never have come up to the average; I mention this because with the exception of being neurotic generally, this may be the only localization of disease in such cases. Chorea magna, with its violent manifestations, wild antics, cataleptic states and epileptiform seizures, is very rare in this country.

## HYSTERIA AND HYSTERO-EPILEPSY.

Hysteria may be met with in the young even of a few years of age; I have seen paralysis with stiffness in a girl only four; all the limbs were affected when she was admitted into the hospital. The paralysis entirely disappeared after two days without any treatment. The separation of the child from her usual sympathetic surroundings was probably the cause of the cure; electricity was not employed, but it will cure more persistent cases. One limb is not unfrequently affected; its spastic condition may disappear by isolation of the patient from his or her parents and friends, or powerful faradic shocks may be needed. I have seen two or three cases which were not cured even by chloroform anæsthesia; the foot was bent to a right angle from the position of talipes equinus and put up in plaster of Paris splints without a good result in

two cases, but a free discussion at the children's bedside about the knife and cutting off the offending member, resulted in a cure. We should be on our guard, however, against terrifying such children, for they may develop less curable neuroses. Hysterical anæsthesia and pains and paræsthesiæ are also of common occurrence.

M. Gayot and others have observed hysterical right hemiplegia and aphasia as early as four years of age, follow violent agitation ; the children came of neurotic stock. The importance of preventing terror and fright in children generally, but especially in those of neuropathic disposition, cannot be overrated. It may be best to remove them from their natural parents and guardians, and to place them with people and children of more phlegmatic constitution. A great deal can be done by mental and moral control or example. Gymnastic exercises of muscles and training of the fingers, voice, and mind should be systematically practised. A second habit may be thereby established which may even wipe out the worst features of the excitable neuropathic disposition.

## BACKWARDNESS.

Backwardness may be due to epilepsy, severe illness, or congenital defects ; it glides into idiocy by imperceptible degrees ; the worst forms are closely like idiocy. Backward children are not necessarily late in cutting teeth, or learning habits of decency, sitting up, walking, talking, and performing such acts as washing and dressing themselves ; it is difficult to fix their attention ; deafness may cause stupidity and backwardness, or inability to speak ; the simplest propositions are only comprehended after more or less "drumming" and perseverance. Merely backward children do advance in the acquisition of knowledge and understanding, though the growth is more or less painfully slow. The education of any child is dependent on his surroundings. Precocity may be

traceable largely to causes in the environment. Some parents are careful to place objects and subjects before their children, others never think of it, and leave the child to satisfy its own wants. A backward child left to itself remains more ignorant than need be the case; it is a good plan to examine the sense of hearing and powers of articulation in infants even before the twelfth month; for defects in hearing or in the external apparatus of articulation may simulate true mental deficiency.

### CONGENITAL AND INFANTILE IDIOCY.

Idiocy is very frequently, if not always, dependent on coarse organic lesions or malformations. In necropsies of congenital idiots I have seen the following:—(1) The hemispheres converted into cysts, the head microcephalic, dolichocephalic, and keeled (scaphoid), and prow-shaped anteriorly. (2) Head good size and shape, except for a slight flattening on the right parietal region; right hemisphere greatly atrophied, almost certainly the result of hæmorrhage at parturition ("Clinical Transactions"). (3) Brain hard in patches, very small, diffuse arteritis indubitably syphilitic (see "Brain," 1885). (4) Large tumour size of orange in right hemisphere; head good shape, but rather small ("Patholog. Transactions," 1887). (5) Microcephalus, atrophy and sclerosis, without arteritis or meningitis. (6) Atrophy and sclerosis, with meningitis and arteritis, originating after birth. In many cases there is mere want of development of convolutions. In cases which come on in infancy the cortex is contused by a fall or blow, or damaged by syphilis, hæmorrhages, thrombosis, or inflammation (see Spasmodic Paralysis). In one case of combined idiocy and insanity the father was a notorious drunkard; and the autopsy revealed no coarse lesion of the brain.

Idiots are often small in body as well as in mind, and may be deformed in both mind and body. There are all grades,

from simple dulness so frequently met with in capable citizens, down to the condition of anencephalous monsters. In moderate cases, the practitioner is consulted because of lateness in learning to stand, walk or talk. Besides mere backwardness, there may be perversion (insanity). Fits, or fits of passion, which, in my view, are not so far removed from one another, often occur. The motor centres are frequently ill-constructed, the mind and motion are, indeed, generally affected together.

## CRETINISM

May be associated with idiocy; the features are pretty much the same as those met with in adult myxœdema, though they look stranger still in the cretin child; loss of function of the thyroid gland appears to be at the foundation of cretinism. Atrophy of the thyroid is frequent in cretins; fatty masses may be found in the posterior triangles of the neck and elsewhere. The **treatment** of idiocy and cretinism consists in attention to hygiene and physical, moral and intellectual education.

Warm clothing and air are essential points, for their mental development appears to be distinctly dependent on the temperature; idiots and cretins are at their worst in winter; their circulation is feeble; exercise and massage are, therefore, valuable. Cretins should be removed from the locality in which the disease is endemic; a well-drained soil is the chief climatological consideration, but attention must be paid also to the purity of the water and to the presence of sufficient sun-light.

The total vitality is so low in idiots and cretins that the digestion, the functions of the skin, lungs, and bowels are easily thrown out of gear; bathing and exercise are beneficial. Cold and damp are great enemies.

When all the corporeal functions have received attention

turn specially to the cortex cerebi and its functions ; the health of the mind or cortex cerebri is largely dependent on the healthy performance of the functions of all parts of the body, but especially of the circulation and digestion. Having got the circulation and digestion in good order, turn to the special and general senses, which are often obtuse and blunted ; their improvement depends on attention to the corporeal conditions and on education. The skin of a cretin feels badly ; it feels still worse if the child be unhappy, be ill, or be cold. Happiness heightens the activity of all nerve structures, and promotes nutrition, and consequently education. Cold causes depression of nervous functions unless the system is strong enough to react against it, which is not often the case in idiots or cretins. Cold interferes with happiness, and illness diminishes vitality ; therefore these causes make the child less happy, and render it still more liable to suffer from depressing external changes.

The benefit of gymnastic exercises for idiots and cretins is great ; but they must not be carried to the fatigue point. Mental and corporeal exercises should be done methodically and carefully so as to educate the cerebral and spinal centres, and in educating to develop both classes of motor and sensory centres ; the peripheral impressions react on the brain, and the brain reacts on the peripheral organs, on the mutual tension principle.

Amusements may be made to give instructions to the eye and ear ; music hath great charms for many of the idiotic class, and these children will do anything so long as they can listen to it ; some may be taught to play fairly efficiently.

Find out what the child likes most (his hobby) ; this is the fulcrum on which levers should be worked, and may be made to serve as a stimulant to education ; the child is to have his hobby if he will learn this or do that ; if he fail, he is not to have his hobby, but if he perseveres and fails still, he may

enjoy it for a while; patience and perseverance will often effect wonders; in this book I cannot go into the individual manipulations and details of life in an idiot asylum; let the reader go to Earlswood or Darenth and examine on the spot for himself the various methods, instructions, occupations and amusements.

## SALAAM CONVULSION, SPASMUS NUTANS, NODDING SPASM.

This clonic co-ordinate spasm is probably dependent on regular rhythmic nerve discharges from spinal centres; the head may be bowed and the trunk bent forwards (salaam) perhaps sixty times a minute; the rate varies in different cases; its pathological associations are with epilepsy; sometimes it may depend on a structural affection of the brain, *e.g.*, the result of a slight hæmorrhage; it may be the only affection in the child, or nystagmus may coexist; it is often associated with rickets, convulsions and epilepsy; the treatment is the same as for epilepsy; hygiene, diet and tonics are of great value since the child is often debilitated and anæmic.

The prescription of frequent short exposures to fresh air should be made as if a medicinal tonic were being ordered.

There are other varieties of *head shaking* and rotating, not only in infants during the first months of life, but also in those of the commencement of the second dentition; they may occur alone, and do not necessarily indicate serious nervous disease; they may be transient, though apt to recur; they must necessarily be due to nervous discharges generally in the lowest motor centres.

*Head banging* is simply a more severe form of the same kind of nervous affection. In the same family one member may have had a salaam convulsion, another chorea, another epilepsy, another bandy legs—phenomena of substitution.

## CHOREA.

Spontaneous movements, inco-ordination of voluntary movement and paralysis are essential features of all cases of chorea. Generally the *spontaneous movements* are the most marked; sometimes the *inco-ordination* is the chief phenomenon; sometimes *paralysis (paralytic chorea)* is *the* most obvious fact. The movements may begin in any part of the body, but the hand is often first affected.

In hemichorea the most volitional muscles (hand) are usually most involved. The *march* of the chorea from part to part may be from face to arm, to leg, to trunk, as might be expected from the anatomical arrangement of the motor cortical centres; this march is by no means always observed; the movements may crop up like bubbles in a stagnant pond in different parts and altogether irregularly; the invasion may be rapid or more gradual. The bulk of the cases are of brain origin, and probably of the motor cortex. Chorea should be regarded as scattered discharges of nerve energy less violent, more continuous than occurs in convulsions and motor epilepsy; as with epilepsy the paralysis is dependent on exhaustion of nerve cells; defective nutrition of the nerve cells is the probable cause of the nerve discharge which produces movements.

The bulbo-spinal motor nerve cells may be the primary seat of disease in a few cases; whether the choreic movements are due to the nerve discharge direct from the cortex, the spinal motor cells merely acting as conductors, is not known.

The defective nutrition of motor nerve cells may be brought about by rheumatism and vascular lesions—hyperæmia, anæmia, toxæmia, embolisms, thromboses; or by such explosive agencies as fright and terror; or as the effect of over-brain-work. The brain may come from a neurotic stock, or be of the neuropathic kind, from some cause or

other (see p. 400). Girls in the second period of dentition are more prone to it than boys; white races than black. The motor apparatus is the chief seat of chorea, but the *sensory* and *mental* apparatus sometimes suffer simultaneously or successively: anæsthesia or hyperæsthesia of the various senses or delirium, apathy, perverted temper, etc. Speech is usually worse when right hemichorea is most marked, probably because the chief motor centre for speech is about the left third frontal convolution. There are numerous varieties of chorea which it would be out of place to discuss here. So far as the mere characters of the movements go I have seen chorea in tubercular meningitis and hydrocephalus. Probably a good proportion of cardiac murmurs are of rheumatic and endocardial significance.

**Treatment.**—The science and art of preserving the health promotes the health of the central nervous system; the hygiene of the nervous system is as effective in promoting the health of the nervous system as general hygiene is. The special hygiene of the nervous system consists in avoiding all sources of peripheral and central irritation to the nerves and centres. Blows on the head or falls are specially injurious in the neurotic; excessive expenditure of energy must be prohibited—competitive schooling, forced education, emotional excitement, fright, terror. Any source of reflex irritation is to be removed: digestive disturbances, worms, bad teeth, masturbation; most of these are gastro-intestinal in situation. Pleasant surroundings are useful in promoting brain health; scolding and whipping, or habitually looking cross at children, and bringing them up under too strict discipline, deteriorate the nutrition of the cerebral cortex, and perhaps of other cerebral centres.

Too little exercise of the special and general senses does not conduce to cerebral health; too great exercise of the same is even more harmful; strong impressions on special

senses should be avoided, great noise especially, but excessive light also; I saw a case of chorea once that was attributed to the sudden sniffing of smelling salts by the child; she screamed and was much frightened by the peculiar sensation; the agitation of alarm passed insensibly into the agitation of chorea. Muscle may waste from too little and from too great use, so may motor and mental centres, no doubt.

Any *digestive* derangement must be rectified straightway; the bowels must be kept daily opened; constipation, cold hands and feet, and chorea are companions.

*Anæmia* is frequently present, and calls for such treatment as is indicated under that section. The importance of dieting, in view of the general debility, constipation, and anæmia, can hardly be insisted on too much. Much nitrogenous food should be avoided; in chorea the amount of nitrogen (urea) discharged is far greater than in health; some meat should be taken, and it should not be salty, preserved or stale, but fresh. A little wine (℥ss.) with the dinner does much good in debilitated children.

Emaciation is frequently a very marked feature, and is very frequently present, suggesting a nervous origin; an interference with metabolism is seen also in the excessive discharge of urea; the disappearance of the wasting and of the chorea are usually simultaneous phenomena of equivalent prognostic value.

Abundance of *fresh air*, *cold douching*, *cleanliness of skin*, *exercise*, and *massage* (see Infantile Palsy), and the obtaining of the requisite amount of *sleep*, are of the greatest service. The requirements of rheumatism (q.v.) complicating chorea must receive attention, and may perforce alter treatment. The vast majority of mild cases get well on the above comprised treatment and sometimes even without it. If the case be at all severe the rest and quiet of bed is most beneficial.

*Internal remedies.—Nervine tonics and alteratives.*—Arsenic seems to me the only remedy that has much influence; do not necessarily give large doses; two or three minims of the liquor, with steel wine ʒii. t.d.s., is a useful prescription for *neurotic* as distinguished from rheumatic and other choreas; it should be given regularly, and immediately after meals; the daily alvine evacuation aids the action of arsenic. Nausea is often relieved by the drop doses of arsenic. That extensive and intense pigmentation of the skin, and perhaps mucous membranes, may result from arsenicals given for chorea, should be borne in mind; the pigmentation slowly disappears on removing the arsenic; temperament and complexion, I am sure, having something to do with its occurrence, and it is not necessarily most marked in the spots most irritated or containing most pigment.

I think in very acute neurotic cases I have seen benefit from the *zinc sulphate* treatment, given in grain doses three times a day, and gradually increased—a grain a day—until vomiting sets in, when the doses are diminished in the same gradual fashion; sometimes as much as ten grains, or even more, may be given three times a day before emesis occurs; Dr. Dickinson used to employ this method frequently; it is generally useless in cases which have already lasted a month.

Systematic *massage* of the whole body, lasting fifteen minutes, once or twice a day, and not less than two to three hours after food, for fear of disturbing digestion, combined with what I shall call over-feeding, has been employed successfully in acute chorea; I cannot think the free administration of nourishment is a good thing in itself; doubtless, however, massage does use up much tissue.

I have employed massage even in cases of hemichorea with apparent good effect; the *food* should be nourishing, but strictly subsidiary in amount and quality to the digestive powers.

*Severe chorea* requires treatment in *padded beds*, with air cushions or the water bed; the Americans recommend slinging in hammocks; crumbs should be prevented from

getting between the sheets, as they irritate the skin and annoy the nervous system.

*Sedatives to brain and cord, or both.*—Chloral, sulphonal and bromides appear to be useful, the movements seldom subside altogether, but the artificial sleep does good; want of sleep always aggravates chorea; the chloral should be given in three-grain doses for a child five years old; its action should be narrowly watched; bromide is best as the potassic salt and may be given in ten-grain doses, carefully watched; when deglutition is difficult, the nasal tube should be used both to administer food and to give medicine; or rectal alimentation and medication may be feasible.

Inhalations of *chloroform* for a quarter or half an hour three or four times a day have benefited severe cases; the vomiting that it may cause nas been regarded as having a beneficial effect; the patients may remain asleep for an hour or more after each inhalation; food should be given by the nasal tube whilst the patient is under the influence of the anæsthetic.

The *spinal ice bag* has relieved severe cases of chorea.

I have seen *tartar emetic* administered in gradually increasing doses, commencing with one quarter of grain, and up to the nauseating point, as with zinc sulphate, without obvious benefit. *Calabar bean* has been recommended in three to six-grain doses three or four times a day. *Succus conii* in 3i. or 3ii. doses, repeated four to six times a day for children about seven, has proved of no value in my hands. A fiftieth of a grain of *hyoscyamine* has been injected subcutaneously, and taken internally night and morning. Hyoscyine has also been used in doses, commencing with gr. $\frac{1}{250}$ for a child of seven.

*Morphia* in $\frac{1}{8}$ grain doses for a child seven years old may be injected subcutaneously in severe cases where sleep is prevented, but chloral or bromides are better.

*Atropine* (gr. $\frac{1}{75}$ to $\frac{1}{50}$) may be given with the morphia; equal parts of Fowler's solution and distilled water have been employed for hypodermic medication by Fruehwald; the solution must be fresh and filtered just before being used; a minim was injected on the first day, and two on the second day, and so forth, until eight or ten were daily injected, when the reverse process took place, the daily dose diminishing drop by drop; the skin was cleansed with thymol solution before the arsenic was injected deeply into the tissues of the limbs which were used in turn; few local disturbances resulted. Tinct. of *belladonna* in large doses, ℥xx. to

xxx. t.d.s., has been highly praised. *Nitrate* (gr. $\frac{1}{6}$) and *oxide* (gr. $\frac{1}{2}$) of silver t.d.s. I have seen frequently used without obvious benefit in any case.

*Valerian* powders (gr. x.), *infusion* ℥i., *tincture* 3i., ammoniated tincture 3ss., have been employed, and successfully, in girls about the onset of puberty. The valerianates of soda, zinc, and quinine, of each about a grain, have been praised by some. *Musk* gr. $\frac{1}{2}$ or tincture of sumbul ♏x. has been tried.

The value of *gymnastics* adapted to the neuro-muscular apparatus specially involved is high.

It has been vaunted in the *cure* of chorea, but is far more valuable as a *preventive*. For neurotic children (see p. 400) there is no natural therapeutic agency which is of more value than careful training of nerve and muscle. Seeing that the motor cerebral cortex is the most probable seat of most cases of chorea, the value of resting, training, and sleeping cannot be over-estimated. Let the child follow its own inclinations as far as possible in the matters of working, exercise and playing.

The special neuro-muscular apparatus to be trained in chorea are those that are most volitional, least organized and most recent. Therefore the *articulatory* and *vocal* apparatus require careful calisthenics. Special hints on this subject may be obtained from Morell Mackenzie's popular work. (See also pp. 11 and 429.) The *hand* movements are exercised by definite prescriptions of movements, as in drawing, playing the piano, and other musical instruments; knitting, sewing, or building wooden houses for younger children; systematic deliberate flexions, extensions, rotations, and circumductions of joints are easily designed. *General gymnastics* and *outdoor exercise*, besides developing motor and sensory nerve centres, improve the circulation, respiration, and excretion; fatigue must not be caused; these exercises are best done when the stomach is nearly empty, say about two hours after food. Massage along the large bowel should be done about three hours after the best meal of the day; the idea is not to upset duodenal digestion; similarly, brain work of any kind must be prescribed as though it were some powerful therapeutic measure or drug; work of the cerebral cortex should be of the automatic kind during and for at least one hour after meals. The rationale is fairly, though not scientifically, clear:—Action of the cerebral centres entails hyperæmia and nerve discharges in them; digestion needs a definite amount of nervous energy to accomplish its ends; energy is often inhibited or destroyed, or reduced to a low ebb by unhappiness or misery; the indications in the treatment of children are

obvious; a child, like a man, digests more readily, and more, the happier it is at the time of digestion.

## LARYNGEAL CHOREA.

It is very doubtful whether this is a pure neurosis, and difficult to say whether slight catarrh is not present. Hyperæmia of the vocal cords has been seen in cases of the kind. Paroxysms of peculiar harsh coughing, ceasing during sleep, and difficulty in phonation are given as its characteristics; it may occur alone or in association with general chorea.

*Electricity* is said to cure it straightway; faradization, with a moderate current, one pole at the nucha and the other over the larynx, should be practised for five minutes twice a day, best about two hours after meals, so as not to excite vomiting or cause indigestion.

**Hygienic treatment** is highly necessary; attention is to be given to the food, clothing of the larynx especially, massage, exercise, fresh air—to improve the general health, and so indirectly that of the nervous system. Local *hygiene* is of great value:—Systematic instruction in phonation, singing and reading aloud, in a proper attitude, so as to bring the vocal cords and accessory apparatus into the best possible position for functional purposes. The head should be erect, the face looking well forwards, the shoulders square, and the chest free from all impediments to expansion; fatigue must be avoided; this practise for ten minutes twice or three times a day, *not* soon after meals, and *not* in a hot, stuffy atmosphere, will effect great good. Various local measures have been tried; insufflation of morphia (gr. ii. to 3i. Bism. Subcarb.) requires caution; mopping the throat and top of larynx with various astringents, as in diphtheria and hooping cough, is valuable. Internally, bromides answer best; belladonna and arsenic have also been used, as in epilepsy.

## SPASMODIC PARALYSIS, CONGENITAL CHOREA, ATHETOSIS, HEMISPASM.

Under this heading may be included a group of affections which are all characterized by one fact; *damage to the pyramidal tract.* These cases are of common occurrence in children. The symptoms, though always of the same kind, vary immensely in extent and in degree; it is common to have spastic paralysis of both legs. The deep reflex actions

are exaggerated and present in abnormal situations; often there is ankle clonus, even when the patient has never walked. The affections may be of intra-uterine origin, may be congenital, and probably due to causes acting during parturition; or they may come on after birth and at any time. More or less impairment of mind up to idiocy, with or without insanity may co-exist. Besides the tonic spasm or rigidity, there may be clonic spasm and inco-ordination of voluntary movement of the athetotic or choreac characters; there is always weakness or paralysis.

The lesion which damages the pyramidal tract, or prevents its proper development, frequently occurs in the motor cortex of brain; but it may occupy any part of the pyramidal path.

The causes of the lesions are numerous: want of development of the motor convolutions and pyramidal tracts, or atrophy and sclerosis, the result of disease—either hæmorrhage or inflammation (meningo-encephalitis), or syphilitic arteritis or tumour. Many cases of holes in the brain—porencephaly—involve the cerebral motor path or centres; there are overwhelming grounds for believing that apoplexy into the motor cortex or subjacent basal ganglia may occur from difficult or instrumental parturition. In cases which occur after birth, the convolutions are damaged, and the pyramidal tract sclerosed as the result of, according to some, thrombosis of veins, according to others, hæmorrhage, and, according to yet others, inflammation. Thrombosis of veins may cause hæmorrhage into the brain as well as on to the surface. I think with Strümpell, that there may be a poliencephalitis of the motor cortex just like the poliomyelitis of the anterior horn of the cord. And this I regard as the pathology of many, if not the majority, of the cases of **infantile (cerebral) hemiplegia,** which is a very common disease of children, perhaps as common as infantile (spinal) paralysis.

These cases begin with fever and convulsions not unfrequently. Of course, thrombosis would explain the symptoms well enough; but the children are sometimes perfectly well at the onset of the disease. Doubtless, paroxysms of hooping cough may cause hæmorrhage into the motor centre or path. These post-natal cases are frequently unilateral, leading to spastic hemiplegia. In cases of cerebral paraplegia or hemiplegia, the limbs do not grow well; there may be considerable difference both in girth and length between limbs of opposite sides; epileptic attacks may occur. In Dr. Hughlings Jackson's case of guinea-pig-like epilepsy, there was a hemiplegia, probably of cerebral origin. These cerebral plegias are often spastic, perhaps always, and after a long course of time, especially when the paralysis has not been perfect and absolute, mobile spasm and inco-ordination rather frequently result (athetosis). The spastic paraplegic condition, with unequal affection of legs, has resulted from cases of otherwise cured basic meningitis; it is rare to have all four limbs affected, but the arms frequently do not escape; the cases are very common, indeed. The hemiplegia which results from embolism and chronic tumours may have the same characters in children; the pyramidal tracts may be simply atrophied or sclerosed.

The bulk of the cases have a tendency to get better; the patient recovers more and more power over his stiff, weak limbs; speech may be affected, and there is also the same tendency to improvement of it. The only vestige of a past infantile hemiplegia may be a mere overaction of a facial muscle, or of a leg muscle, for which latter an orthopedic surgeon is consulted.

The proper **treatment** (tumour cases are not considered here) of these cases is education, both mental and muscular. Education includes the bringing out of the greatest will-power of which the individual is capable. The child should

be taught to speak and to walk by taking daily lessons in these arts; if the case be not severe, the patient may possess the notion of putting one leg in front of the other when he is held out, by the teacher's hands placed under the armpits. Mechanical extension apparatus may be used if necessary, with a view to get the joints straightened out of their flexed position. Sometimes there is *crossed-legged* progression, resulting chiefly from a spastic state of the adductors of the thighs; indeed, the spasm is generally most marked in the adductors; massage and faradism are not to be used, for they simply increase the action of the already over-acting spinal motor centres; the constant current may be used daily as a sedative; weak currents only should be employed, the positive pole being stationary and the negative moved about; iodide of potassium may be given for long periods in small doses, and appears to do a little good; fits should be controlled by bromides and belladonna as recommended for epilepsy. Opposing a resistance to the performance of any weak movement is a valuable method of evoking the maximal force of which the nerve cells concerned are capable.

Perseverance in gymnastic exercises of the limbs and of the muscles of articulation should be persistently and patiently advised; the child should be taught to attempt the enunciation of simple vocal sounds; surprising success sometimes attends persevering efforts. Cold douches are of but little service unless the general health be below par, which is, in my experience, not always the case.

## INTRACRANIAL TUMOURS.

Tubercular tumours are most common; glomata are not rare; gummata are met with. I have seen a genuine hydatid in the right cerebral hemisphere of a child three years old; cysticerci cellulosæ occur; cerebellar tumours are very com-

mon in children, and pontine gliomatosis is common; it used to be thought rare. Caseous masses are most common, and in the cerebellum ; they may be single or multiple and cause no symptoms, especially those occupying the lateral lobes. The symptoms of reeling gait, increased knee-jerks, rigidity, falling and tremor are in my belief the result of pressure on the pyramidal tracts. Headache, vomiting, and optic neuritis going on to atrophy are far more common with cerebellar tumours than tumours elsewhere; this frequency is doubtless due to the confinement of the cerebellum in a comparatively closed chamber whose ceiling is the tentorium.

The vomiting is most frequently *paroxysmal* and *matutinal*. The headache *occipital* and *paroxysmal*. Nystagmus, squinting, bulging of the occiput and hydrocephalus are common symptoms. The first two are due to pressure on the floor of ventricle, and the last two to purely mechanical conditions (see Hydrocephalus). I have notes of three necropsies of cerebellar tubercular tumours in which the first symptom and death were separated by an interval of at least two years. From this alone it may be argued that recovery, so far as mere life is concerned, is possible ; an argument for cerebellar surgery is thereby adduced. Cysts are met with in the cerebellum, and frequently without causing symptoms ; they are frequently not genuine tumours—that is, they only occupy that space which should be occupied by brain tissue.

The *diagnosis* of intracranial tumours cannot be made in the presence of headache, vomiting, and optic neuritis. Meningitis and blood conditions (as in chronic renal disease, which may occur in children), and perhaps hæmorrhage, may cause all three symptoms. Consequently the diagnosis of "coarse" disease of the brain is not established by this trinity of symptoms; there is no difference between children and adults as to localization of tumours—no more than has been already indicated as to the frequency of site of tumours.

Bulbar palsy may be simulated by bilaterally symmetrical cortical lesions. Nothnagel suggests that the early occurrence of reeling gait and the development of unequal and imperfect ophthalmoplegia are signs of the tumour having begun in the corpora quadrigemina.

The *diagnosis* of the nature of the tumour is made by the attendant associations, rarely by the nervous symptoms; gliomata are usually apyrexial; hydatids may exist in other parts of the body; there is usually historic or actual evidence of syphilis. The optic neuritis may be unilocular, as in Brailey's case. Hughlings Jackson says the opposite hemisphere is diseased when the neuritis is one-sided—in his experience of three cases.

**Treatment.**—*Medical* is very serviceable when syphilis is at work; the treatment depends on the nature of the tumour and its situation; iodide of potassium or sodium should be given freely for some weeks in as large doses as possible; large doses if prescribed all at once may disturb digestion, as has been experimentally shown for many drugs; frequently repeated doses are generally better; remember that the health must be maintained by every hygienic means in our power; cod-liver oil may be given as for scrofula.

A plentiful supply of fresh, not too cold or moist, air; careful clothing of body, and regulation of regimen are cardinal considerations.

Exercise may often be a possibility; many cerebellar cases continue to play about in the intervals of freedom from pain and pyrexia; sad, indeed, is the lot of those whose death is preceded by more or less complete blindness, the result of post-neuritic atrophy of the optic nerve.

*Local* inunction of lanoline ointment of mercury or ordinary blue ointment into the scalp is occasionally very effectual. Iodide of potassium ointment is used, but is very inefficacious. Oleate of mercury 5 per cent. painted on is certainly more cleanly than the other mercurials.

*Brain Surgery.*—If this treatment prove of no avail, and if there be

no evidence of extensive tuberculization, and if there be evidence of the situation of the tumour in either cerebral hemisphere or cerebellum, it is only right and just to get the careful and antiseptic surgeon to trephine the skull over the seat indicated and to proceed as circumstances dictate. Trephining alone has given great relief from pain in a case of tubercular tumour of the cerebellum (Goodhart); cysts would almost certainly be completely cured by surgery; trepanning as an exploratory operation is justifiable when the diagnosis of tumour is fairly probable; cerebellar even more than cerebral surgery, is in its infancy.

**Expectant treatment.**—Plenty of fresh air at the seaside for the scrofulous; rest in bed whenever severe symptoms are present; a single free purge often relieves cerebral excitement; the ice cap or Leiter's tubes may be used to reduce excitement and abate headache; feeding by the nasal catheter is to be practised when deglutition is difficult.

*Pain* may be relieved by attention to the bowels, ventilation and diet, and by cerebral sedatives—opiates of Dover's powder gr. v., or chlorodyne ♏v., or better still chloral gr. v. and bromide gr. x., in syrup or honey for a child of five. Headache may be combated by icebags or iced cloths left on or repeated; and by painting over an area of skin with menthol (crystals dissolved in alcohol to saturation) or by the use of the solid liniments.

*Vomiting* is often relieved by the same measures as relieve pain; small doses of fluids given frequently, iced or effervescing, are generally kept down; the horizontal position on one side may relieve vomiting and headache. Try a hot bottle to the epigastrium.

*Constipation*, often obstinate, may be relieved by simple aperients and small enemata (℥ii.) of soap and water. Cascara Sagrada Liq. Ext. in pastils, capsules or elixirs, one or two a day are very serviceable for such cases. Simple measures not powerful purges should be used—enema, suppository, rhubarb syrup, compd. liquorice powder, castor oil, decoc. of aloes, aloine, jalapine.

## CONGESTION OF BRAIN.

Congestion of the brain of the active kind is probably associated with excessive action of the centres involved. Many symptoms are ascribed to congested brain, but the whole subject is ill understood. An outline of an unpub-

lished case which happened in my experience may be given. A female infant, aged seven months, had right unilateral convulsions and paralysis lasting for four weeks, followed by recovery for a few weeks; next she had left unilateral convulsions and paralysis, from which she also recovered; finally, she contracted mild scarlet fever, from which she was recovering, when right unilateral convulsions again supervened, and she died after they had persisted ten days. The necropsy showed thrombosis of cerebral veins, with hyperæmia and spotted blood extravasation, limited to the following convolutions on the left hemisphere: Ascending frontal and parietal, parietal lobule, and supramarginal and angular gyri; there was no clotting in the longitudinal sinus; the thrombi in the veins were rather firm, but not adherent. Were these appearances the cause, companions, or consequences of the convulsions? The rest of the brain was white by contrast. Ask the same question if the hyperæmia is more extensive. Cases have been diagnosed as congestion when none has been found post-mortem; and congestion has been discovered at the necropsy when not suspected during life. That congestion may result from dynamic overaction of the nerve cells may be believed; this congestion may proceed to thrombosis or to hæmorrhage, or to both thrombosis and hæmorrhage, and so secure permanence for a disease which was at first dynamic and functional. No matter what the nature of the organic lesion, the symptoms informing of its presence may be purely accidental, and might have occurred in its entire absence.

**Treatment** under these circumstances should be of the symptoms, without regard to theory, for the diagnosis is impossible. If there be heat of head, and the child be robust, ice bags or Thornton's cap may be used to the head, which should be shaven if there is much hair thereon. If the child be restless, and intolerant of noise and sound or

other peripheral irritations, these must be abated as recommended under Meningitis and Cerebral Hæmorrhage. The diet should be regulated in accordance with the fever and state of digestion. Fever requires a low diet of milk and barley water, mutton broth, chicken and veal tea, etc. Vomiting and thirst are relieved by the usual means (see p. 322), and the bowels should be regulated by simple remedies.

Dr. J. Simon prescribes a week's course of bromides, followed by a like period of suspension; in urgent cases the bromides should be given for two weeks together—a grain to infants under three months, three to those above three months, four above six months, and five to children above a year and a half; the potassic salt is used as being more stable and efficient than the sodic; it may be given in aromatic water with syrup; special stress is rightly laid on keeping the bowels open; sea air is to be avoided, and also noise, excessive light, or other peripheral irritation.

## MENINGEAL AND CEREBRAL HÆMORRHAGE.

Meningeal hæmorrhage is not uncommon in the new-born from prolonged labour and compression of the head; many cases of apoplexy of the brain substance have occurred from such causes.

The infant may die asphyxiated; if life be preserved cysts may form in the arachnoid cavity or in the brain; or in the latter situation a rusty, pigmented scar (porencephaly) may result and be the cause of congenital spasmodic paralysis. Aneurism due to infective emboli from heart disease, thrombosis of cranial sinuses, or obstruction of them by tumours; paroxysms of hooping cough, convulsions, tetanus and cachexia however produced; purpura, and rarely aneurism —are causes of hæmorrhage both into the brain substance and into the meninges in children. Many causes, and especially toxæmias, may produce symptoms like those caused by intra-cranial blood extravasation. Apyrexia is not always

indicative of hæmorrhage, nor hæmorrhage always indicated by apyrexia. Hæmorrhage may occur, and be attended with pyrexia when all other organs are healthy; the existence of thermogenetic centres above those of the bulb must be allowed. *Sudden* hemiplegia may be due to simple exhaustion, to convulsions or tumour, as well as to thrombosis, embolism, and hæmorrhage; the hemiplegia merely indicates the seat of lesion.

Meningeal hæmorrhage may cause no obvious symptoms, and often there is nothing to enable us to localize the situation of the extravasation. In cases in which diagnosis is doubtful, **treatment** can be only of symptoms.

Absolute rest and removal of all sources of irritation, in a cool, darkened chamber, are generally good directions; watching the case—expectant treatment—is the thing. Sudden hemiplegia *may* be of hysterical or neurotic origin. The bowels should be opened if constipated; this may remove one source of peripheral irritation and of blood deterioration. I prefer not to use even a single dose of calomel in clear cases of cerebral hæmorrhage attended with sthenic symptoms in children; the bowels may be cleared by an enema of four ounces of soap and water, with a dram of castor oil. Indeed, no harm will result from free watery purgation, unless the child be greatly debilitated and cachectic, when the symptoms may be due to thrombosis rather than extravasation. The diet should be low, and should consist of slops, without stimulants, if there is heat of head and pyrexia; or it should be nourishing and stimulating if there is persistent collapse.

In cachectic states the infant may possibly have been properly nourished, even at the onset of the brain symptoms; and the thrombosis may have occurred in spite of careful feeding.

The head may be cooled, if hot, by Thornton's cap or an ice bag, or cold cloths wrung out of iced water. Some

advise one or two leeches to the nape of the neck or behind the ear, or dry cuppings; free bleeding can only be condemned.

The head should be shaved if very hairy. If the veins of the neck are engorged the head should lie high, otherwise the complete horizontal posture is best, as tending to aid the circulation and to reduce the pulse rate. The surface of the body should be kept warm, and especially the feet and hands; hot bottles may be used, but not in contact with the skin; the temperature of the room should vary with the presence or absence of fever, 50° if present, 60°-70° if absent.

*Feeding* must be managed with skill, for there may be weakness of the pharyngeal and laryngeal muscles, causing choking or regurgitation of food through the nose. In order to avoid this the child should be fed lying on its side, so that any food not properly swallowed may flow out at the side; but any trouble of the kind is best averted by feeding with the nasal tube.

During *convalescence* everything likely to conduce to the perfect absorption of the blood clot should be remembered—nourishing food, abundance of fresh air, etc. The hygiology of the brain must not be forgotten; excessive study or overwork of any kind, excitement, passions, and the like, are to be avoided or averted. Excessive stimulation of the sensory nerves of special or general sense must be prevented by keeping the child at the greatest possible repose; and obtaining regular sleep is most essential. Iodide of potassium is not of service in such cases where the diagnosis is not dubious; it is far better to trust to general tonics; iodide of iron may meet both tonic and absorbent indications.

I can only protest against the use of *counter-irritants* during the period of acute disease with severe cerebral symptoms. Alarming blistering and ulceration may follow

the application of sinapisms to the calves of the leg and soles. Doubtless such results may be attributed to defective innervation (trophic lesions), but the mustard must have had something to say in the matter. For the same reason calomel and powerful irritant purgatives are best avoided, for it may set up a persistent diarrhœa, doubtfully due to ulceration, and conceivably also of trophic origin. The same considerations hold good when applying hot bottles *near* to the feet; the foot of a child has been badly ulcerated from this cause; it was a case probably of hæmorrhage from which persistent hemiplegia resulted.

Quinine may be used in five-grain doses to subdue pyrexia, but prefer other means, as the ice-cap or wet pack. Quinine is said to be specially serviceable in the pyrexia that goes with embolism; that quinine in such doses has any appreciable action on the staphylococcus pyogenes aureus or albus, the micro-organism which is regarded as the cause of many diseases besides infective endocarditis is doubtful; the heart is frequently perturbed in cases of cerebral hæmorrhage; bromides are valuable in arresting cardiac as well as cerebral excitement; digitalis and belladonna may be used.

## THROMBOSIS OF CEREBRAL SINUSES.

The commonest causes are general prostration and local inflammation; the commonest cause of general prostration causing cerebral thrombosis is severe diarrhœa in infancy; infants, under any circumstances, are more liable than older children; this thrombosis is almost always in the longitudinal sinus.

The commonest cause of local inflammatory thrombosis is extension from aural disease; this form affects mostly the lateral and contiguous sinuses; it is not specially related to infancy. The symptoms of both forms are indefinite; "spurious hydrocephalus" or coma, convulsions and collapse may be due to the exhaustive variety; coma, convulsions, and delirium may be due to the inflammatory kind. For

treatment, the reader is referred to "Otorrhœa" and "Inflammatory Diarrhœas."

## TUBERCULAR MENINGITIS.

Meningitis from tubercles varies greatly in degree; some of the symptoms are due less to inflammation than to local anæmia and congestion, the effects of arteriole blockage; the causes are principally those of tuberculosis; heredity is marked so far as tubercle goes; the fatality of tubercular meningitis prevents direct heredity. Hooping cough and measles are frequent precursors. Cases occur in the first years of life; but the period from the end of the first to the beginning of the second dentition yields the largest number of cases. Contrasting strongly with simple meningitis, which sets in suddenly in the midst of blooming health, the tubercular disease is *generally* gradual in its clinical commencement; still the premonitory symptoms are not pathognomonic; they may be attributed with equal acumen to the belly as to the brain.

No disease is more protean in its commencement, course, or clinical characters; one is far more struck with the dissimilarity than with the similarity of the clinical course; no two cases are altogether alike, unless it be in the post-mortem appearances.

Stages may be recognized; but often confusion of the stages is observed; remission or almost complete disappearance of symptoms is frequently observed; sometimes this disappearance may last days, and occasionally months. Some cases may end in recovery. "Irritation" and paralysis of functions may coexist, or the latter may come first; at times a series of irritative and non-irritative stages is observed in the same case; the phenomena of "irritation" are as numerous as the functions of the nervous system; so may be the paralytic phenomena or those indicative of

absence of action in the nervous centres. The same cause may produce both irritation and non-irritation; it is usually conceded that action or irritation is due to a less degree of action of the same cause that is needed to produce absence of action, "non-irritation," paralysis.

The mental, motor, sensory, vasomotor, and trophic apparatus may present symptoms of irritation, *i.e.*, of nerve discharge and of paralysis, or absence even of the ordinary amount of nerve current.

Delirium with constant convulsions and shorter clinical course are more marked phenomena in the rare cases in which the convexity of the brain is the seat of the meningitis; death may not seem adequately accounted for by the post-mortem appearances; the ordinary basic form often runs on for three weeks, and even more than that; on the other hand death may occur in convulsions within a few hours of the onset, which may be sudden; sudden hemiplegia may be the first sign.* The amount of softening of the walls of the cerebral ventricles and of internal hydrocephalus varies in different cases; the explanation of this is uncertain; spotty "capillary" hæmorrhages are frequently observed in the neighbourhood of small tubercles; pathognomonic symptoms cannot be assigned to them.

**Treatment.**—Powerful antiphlogistics and counter-irritation have been and are still used as for simple meningitis, q.v.

Blood-letting, severe purging, free blistering, and mercurialization must all be condemned; even former advocates of blood-letting now relinquish this practice in tubercular, though continuing it in simple meningitis; active purgation is rightly regarded as useless by most authorities. Expectant treatment is the best, attention being paid to the patient and to the symptoms. All lowering measures are unjustifiable; secure absolute rest for the mind and body, and an agreeable

* See a case in the "Clinical Transactions," Vol. xvii.

apartment and able attendant who should be acceptable to the child; try to secure rest in bed or on the couch in a capacious chamber, well ventilated, free from sanitary defects, and in the quietest possible position. Lesions in other localities may modify treatment a little. Open the bowels once a day, if necessary, with an ounce enema, or a dram of syrup of rhubarb or senna or liquorice powder. The *diet* must be digestible and nutritious, with plenty of hydrocarbon (fat)—as much as can be got down and can be digested. Cream, milk, beef tea, underdone meat, pounded chicken, Mellin's food, custard, egg, bread-and-butter; all of these may be taken when fever is absent; feed frequently and in small doses; feed especially when apyrexia is present.

*Tonics.*—Iron and cod-liver oil are valuable when there is no, or but little, fever; some rub in cod-liver oil; it is uncleanly; and simple oils are better; they may be rubbed into the axillæ, groins or abdomen, but not all over the surface of the body. *Specifics.*—Iodine is so regarded by some; the tincture may be given in one or two-drop doses t.d.s.; some give iodides instead, or even with the tincture; the doses may be increased or diminished according to the effects produced.

Iodides, especially of potassium, starting with one grain t.d.s., is highly recommended by a great number of authorities; large doses and long continued is the prevalent method; some prescribe it with liq. hydrargy. perchloridi; such treatment is valuable in promoting absorption of inflammatory matter; but no good influence can conscientiously be set down either to the iodide or mild mercurial treatment of tubercular meningitis; diarrhœa may be dependent on iodism. Iodoform in half-grain doses at the commencement has been prescribed, with the object of destroying the bacillus; watch for sickness, collapse and sweating. Several cases of tubercular meningitis are said to have been cured by the infriction of Ung. Iodoformi (1 part of iodoform to 5 of vaseline) into the shaven scalp; about a dram of the ointment is rubbed in twice a day, and a cap of some impermeable material is constantly worn; nine to 22 days is the time required for a cure.

*Sedatives and Antispasmodics.*—A warm bath, T. 100°, to relieve convulsions; the effect of bromide of potassium gr. v., is often greatly enhanced by the same dose of chloral in syrup, for a child five years old.

Fluid extract of Valerian U.S.P. ℥x. may be used frequently. Opiates should not be used, unless all other means fail; they may increase the distress and constipation; some use poultices with laudanum and opium plaister; a mustard foot-bath two or three times a day is always safe.

*Counter-irritation.*—Wholesale blistering or sinapisms are barbarous; but an occasional blister or sinapism has seemed to many observers to mitigate the symptoms of excitement; they may be put to the nucha, behind the ears, over the heart, or on the calves of the legs. I do not recommend them in any way unless over the heart to treat a sudden syncope which occasionally occurs even in the prodromal stage. Vomiting may be rarely relieved by a mustard leaf to the epigastrium or nape of the neck.

*Cold applications* to the head are most valuable for abating fever and restlessness, and causing sleep; they will often relieve vomiting and pain; the head may be shaved, or close cropped. Wet cloths or lint under oil silk, irrigation with Leiter's tubes, and ice cap or bladder and cold affusions are used. Simple irrigation is objectionable, as likely to wet the chest and bed. Cold effusion should be practised out of bed. Hot fomentations and starch poultices have been tried by some.

*Prophylaxis.*—Obtain the most perfect sanitation, hygiene, and cleanliness possible. A phthisical mother should not nurse her offspring. Cleanliness in the matter of food and drink, which may become contaminated by the bacilli and epithelia from the breath of the ubiquitous tubercular poitrinaire, is clearly of the greatest moment. A germless and bright atmosphere is best for the tuberculously predisposed —sea air and mountain air. Phthisis and tubercle flourish on a humid soil and atmosphere.

The diet should be that recommended for scrofula; avoid cerebral excitement and excessive headwork; these children are ready scholars; abatement and repression of mental and physical energy should be practised rather than forcing. Such children should be made as happy as surrounding circumstances will permit; some are generally well contented; others "grizzle" all day; warm woollen clothing and careful dieting should be ordered, to prevent catarrhs; the neck and arms as well as the legs, chest and belly, should be carefully clad; cod-liver oil should be taken as a food, and iron if there is anæmia.

The hair of the head, as in children generally, should be worn short, and the head gear be not too heavy. A woollen cap is best for the winter; the feet and hands should be kept warm. Gymnastics and exercise, with as much fresh air as possible, should be enjoined, but short

of producing fatigue. A large straw hat should be worn to protect the head from excessive sunlight and heat. Keeping open a seton or blister at the back of the neck or head cannot be advised under any circumstances, as it would surely be a point for inoculation unless kept strictly aseptic.

## SIMPLE MENINGITIS.

Simple meningitis is not very common; it would be rarer still if falls and blows on the head were prevented, and if otorrhœa, carious teeth and disease of the nose with their bone diseases, were rapidly cured. If septic causes were absent, simple meningitis would very rarely be seen; acute specific fevers, erysipelas, and disease of the umbilical veins in the new-born may cause it; sometimes it is of unaccountable origin; infants are its most frequent victims. The symptoms themselves may not be essentially different from those of tubercular meningitis; they are often very few in number, especially in infants; the want of development of the brain may explain this; this fewness of cerebral symptoms makes it difficult to diagnose meningitis from pneumonia and other inflammations, because in the latter there are identical cerebral symptoms, induced either by peripheral irritation or by toxemia. An infant aged four months had vomiting and diarrhœa for two days; two days later it became convulsed and died; pus coated the whole of the brain and cord; the middle ears contained muco pus, but the bones and membranes were perfect; the kidneys showed white serpiginous areas probably due to vascular spasm.

## CERVICAL OPISTHOTONOS.

This is a common symptom of disease in infants, and frequently the only obvious evidence of basal meningitis. This meningitis is certainly sometimes syphilitic; it is most common under one year of age; it is often chronic. In one case, aged four months at death, the infant had had a retracted head for two months; occasional vomiting, inces-

PLATE III.

A CASE OF "OPISTHOTONOS" IN A CHILD AGED EIGHTEEN MONTHS.

sant small movements of the right hand (microkinesis), rigidity of the left arm, *regular* pulse, about 100 whenever it was counted, temperature not above 100° whenever it was taken, cervical opisthotonos worse at times than others, slight emaciation, retracted belly—were the symptoms. The under surface of the cerebellum was firmly stuck to the posterior fossa of the skull and to the posterior boundaries of the fourth ventricle, shutting the foramen of Majendie; the adherent membranes were opaque and of buff or reddish tint; there was considerable hydrocephalus, that had developed slowly; the fluid was clear; the child had had snuffles, but no other syphilitic lesion; the ears were healthy; convulsions are not uncommon; strabismus and nystagmus are sometimes seen. Certainly cases, clinically resembling the above in all respects, do recover—the names of this meningitis are "occlusive," "posterior," and lepto-meningitis infantum. (See illustration.)

Cervical opisthotonos may be due to a rheumatic affection of muscles, when there is always some tenderness and more screaming or pain on attempted reposition of the head. The symptom is often due to cerebellar tumour; ear disease and cervical caries may be its cause, and many other peripheral irritations such as tender cervical glands, pneumonia, abdominal and other disturbance; but it seldom lasts more than a week unless there be meningitis or a tumour. The diagnosis of meningitis is surrounded with difficulties, of which the main have been indicated in this chapter and under "Typhoid Fever."

**Treatment** largely depends on the cause; in *infants* a few months old, syphilis should be suspected; the inunction of blue ointment into the back of the head is what I practise and advise; a small piece may be rubbed in every morning; a flannel cap should be worn; care should be had in moving the infant not to increase its suffering; the head should rest on a soft pillow when the retraction is great; the suffering,

however, does not appear to be severe in all cases. Vomiting seldom requires treatment. Hydrarg. c. Cret. gr. i. may be given three times a day, placed on the back of the tongue, and rinsed down with a little water, to increase the effect of inunction, and to allay sickness. Sometimes fractional doses of calomel, gr. $\frac{1}{8}$, succeed better. Constipation is commonly not overcome by gray powder; a little piece of soap placed in the rectum may suffice; any simple purge may be used.

Iodide of potassium may be prescribed, as well as the mercury, in one-grain doses, gradually increased; it has not effected much good in my hands.

Unless due to suppurative bone disease, or pyæmia, **simple basal meningitis** in older children is not altogether hopeless. There is a good record of recoveries from almost undoubted meningitis, recovery after nearly all hope had passed. These cases may be associated with otitis, and not with bone disease; in these mild chronic cases powerful antiphlogistic treatment should be deprecated; expectant treatment is the best. Mercury and iodides may be useful, but nature and nursing far exceed them in value. Bloodletting is almost never required; there is just the possibility of a couple of leeches proving beneficial in the paroxysms of excitement with great heat of head; though ice-bags or Thornton's ice-cap may be preferred; the wet pack is most useful under similar circumstances.

In the **acute meningitis** of older children, venæsection, leeches and dry cupping have gone out of fashion; and for the most part rightly; instead of putting leeches to the temples or behind the ears, some leech or dry-cup the arms or legs.

*Purgatives.*—Calomel has been given in large doses frequently; this cannot be condemned too severely. A simple calomel purge to start with, say two grains for a child of four, and followed by castor oil, or given with Pulv. Jalapæ Co. gr. x. or jalapine gr. ii. may be of value when the head is hot, the pulse bounding, and the skin burning. After that the bowels should be kept in daily action by simple non-irritant

purges—castor oil, syrup of senna, rhubarb, fluid magnesia, liquorice powder.

*Antiphlogistics.*—Mercury, either by inunction or in fractional repeated doses, is still employed by many; I have seen no good come of it in these cases; calomel gr. $\frac{1}{6}$ or Hyd. c. Cret. gr. i. every four hours are common prescriptions; some give it still more frequently.

*Counter-irritants.*—Mustard-leaves and poultices to the limbs and trunk are systematically used by some; an occasional sinapism to rouse the heart is good; systematic sinapisms are useless, and may be productive of ugly ulceration. Blisters ought not to be used. Authorities differ as to their mode and time of application; they may be actually injurious by inducing sores; some use them when the acute stage has subsided. M. Rilliet advised revulsion when meningitis follows a suppressed eruption, of which but little is known; he proposes pustulation by croton oil, and relates one recovery; the head should be first shaved; fifteen to twenty drops of the oil are rubbed into the scalp with a glove four to six times a day; the eyes must be protected; such treatment might be styled barbarous.

Advocate **expectant treatment**; the head should be shaved if there be much hair on the scalp; paroxysms of febrile reaction and restlessness may be best abated by the application of cold to the head; sudden, not violent, affusion is very good; a pitcher of cold water (60°) may be poured over the head whilst the body is in a bath at 100°. Thornton's ice cap or Leiter's tubes with a circulation of cold water is an effectual method. The wet pack is very valuable for violent excitement. Quinine may be used for high fever; cold applications are preferable; do not employ quinine at all until the patient is convalescent, should such be the fortunate termination.

*Delirium.*—Chloral may be prescribed, but its administration should be carefully watched; half a dram of the syrup or five grains of the hydrate with five of bromide may effect wonders in mild delirium; opiates are decidedly useful; chlorodyne five minims or Dover's powder five grains for a child five years old; succus conii and hyoscyami are used; opiates or chloral and bromide are better.

The diet should be low and non-stimulating during the excitement stage or stages; iced milk, frozen milk, thin beef tea and light broths are good; the child may have to be fed by the nasal tube or rectum.

In chronic cases the food should be nourishing—eggs, meat, milk, jelly, malted foods. Difficulty in deglutition requires very careful feeding, as in diphtheritic palsy, for the food may go the wrong way. Even

if it do not actually choke the patient, bronchitis and pneumonia may result from minute particles entering the tubes; this is very likely to happen when the cerebral cortex is not acting normally.

The dorsal decubitus is not the posture in which to feed patients in any exhausting disease, for the neuro-muscular apparatus is weak, and imperfect inco-ordination readily occurs; turn the patient on his side; the nasal method is best whenever any distinct difficulty of deglutition exists.

*Convalescence and recovery.*—This, if it occur, takes many months; even years may elapse before the patient can walk alone or say many words. Rapid recovery is rare.

Cold douches—the temperature to be regulated so as to cause reaction—are excellent tonics; massage, shampooing and passive movements are the therapeutic measures in the early stage; galvanism is useful, and is employed as in infantile palsy; the patient may be set in the warm bath in which plenty of salt is dissolved. There is no affection for which more can be done by shampooing, salt baths, etc., than such cases of recovery from meningitis. The business should be taken in hand systematically; the ankles should be flexed as far as possible by a skilled hand every day; they may be very stiff and extended; strive to overcome the adduction of the thighs, and prevent dislocations of joints by strict attention to postures during the illness; great force must not be used lest the skin be torn or other structures ruptured. The sight returns before the power of sitting up or using the hands, and the power of walking, if present before, returns later. There is frequently no papillitis.

The skin is often very harsh, wasted, and scaly; a warm bath every day may do something to remedy this, and the infriction of sweet oil or neat's-foot oil is very good; such rubbing in may, indeed, serve as a supply of fatty food.

The skin must be kept scrupulously clean to prevent the glands from becoming choked at their openings; when con-

siderable progress has been made, corporeal and cerebral gymnastics should be instituted ; opposing some movements by offering an additional load to the muscle tends to evoke greater action from the nervous centres.

The child should be encouraged to stand and to try to walk (in a go-cart at first) ; simple words should be tried, and repeated till properly pronounced ; the atrophy appears to be quite as much nervous as muscular ; the emaciation is often extreme, yet it may be followed by great fatness.

Later still, enjoin exercise in the open air ; light dumb-bells and Indian clubs, if the child is old enough, and the horizontal bar or trapeze are useful apparatus.

Still later, reading aloud for a short time is a good mental gymnastic, and the child should be diverted by pictures and conversation—partly to make it happy, partly to educate the eye and ear and their cerebral equivalents.

### OTITIS MEDIA—OTORRHŒA.

Otitis media is common in children, and may give rise to symptoms (pain, fever, convulsions) indistinguishable from those of some cases of meningitis. Otitis may be a cause, companion or consequence of meningitis. Severe and constant pain in the head, which is almost incessant till the tympanum is emptied, is a special feature of otitis; in infants persistent uncontrollable crying is the sign of the pain, and they object to manipulations of the concha; the breast may be refused, and the side of the head affected may be burrowed into the bosom of the mother, or the softness of the pillow.

Purulent otorrhœa, especially of some standing, may cause thrombosis of the cranial sinuses, cerebral or cerebellar abscess or suppurative meningitis. It probably does so by direct extension of inflammation, with or without necrosis of bone ; it is very doubtful whether genuine metastasis occurs independently of direct continuity of inflammation.

Some cases of otorrhœa are probably due to scrofulous disease of the bones of the ear. Scarlet fever is often followed by otorrhœa, measles less commonly. The discharge may be offensive or positively overpowering. Suppuration in the middle ear is very apt to be associated with suppuration in the mastoid cells. The mastoid cells are but ill-developed at birth; they are in direct communication with the middle ear.

The commonest places for abscess to develop are the temporo-sphenoidal lobe and the cerebellum.

The clinical characters of brain affections resulting from otorrhœa and otitis are not at all pathognomonic; all symptoms may cease after removing the pus from the tympanic cavity, or after trephining the mastoid cells; usually the symptoms set in suddenly with high fever and convulsions, or chills in older children; death may ensue rapidly in coma, with varying pulse and low temperature; the signs may be all those of simple meningitis. Abscess may give fever or a low temperature, chills, or convulsions, headache, delirium and optic neuritis, with or without paralysis, according to its site; fulminating coma is the appanage of abscess more than of meningitis.

There is no complaint in childhood more urgently demanding definite treatment than otitis and otorrhœa, and few that yield more readily to prompt and proper treatment.

In all cases of convulsions and constant screaming in infants the ears should be carefully inspected with the naked eye and speculum; if necessary, chloroform may be used to facilitate the examination; the external auditory meatus may or may not be simultaneously inflamed; the hand of the sufferer is by no means always applied to the ear; it is said that mere inflation with Politzer's bag, the nozzle being in one nostril, and the other nostril being closed, may empty the tympanum of any matter it may contain. I have tried this method in even grown-up children, with the aid of simultaneous deglutition, and have considerable doubts of its efficacy in removing pus from the middle ear, though it is useful in mere

deafness from Eustachian obstruction. The best way is to incise the membrana tympani with a very narrow tenotomy-like knife; the operation is really not very difficult; the relief afforded is instantaneous in acute otitis media; if a discharge has already occurred the greatest desire should exist to have it dried up effectually. Many cases of not very offensive otorrhœa yield readily to syringings with any warm antiseptic water; the head should be bent over a basin, the mouth widely opened, and the fluid syringed with an indiarubber ball syringe and ivory nozzle of suitable size; the injection should be made slowly and with uniform pressure; if possible the fluid should be got to run out of the nostril on the same side, which is the object of the position mentioned.

If the otorrhœa do not quickly cease, an insufflation of fine iodoform or iodol powder may be practised after each syringing, which should be performed two or more times a day, according to the amount of the discharge and the degree of its offensiveness.

Of late years the dry method appears to be the best; very carefully dry out the ear several times a day by the use of mops of salicylic or iodoform wool; on the principle that where no moisture is no sepsis can take place.

If neither simple syringing nor iodoform insufflation succeed, antiseptic and astringent lotions may be tried; caution is very necessary in their use; giddiness may be easily set up; indeed, simple syringing may cause vertigo; sometimes the use of the antiseptic lotion has appeared to develop the cerebral complications; a warm quinine lotion is very good.

℞ Quinæ Sulph., gr. i.
Acid. Sulph., dil., ♏iii.
Aq. ℥i.

or sulphate of zinc in the same proportions.

If these means do not cure the case soon—say in a week or so—a thorough inspection of the ear, under chloroform, ought to be made. Any polypi discovered should either be scraped away or burnt with the actual cautery or strong perchloride of iron.

Anything like necrosis or caries, with much fungating material, should be treated *secundum artem* by the careful aseptic surgeon. A free way of escape for discharges should be made, and, if necessary, gouging away of mastoid cells, so as to obtain free and ample communication between them and the tympanum, should be practised; these cases do remarkably well with so-called "lasting" dressings; all the diseased tissue and bone should be scraped away and the whole area rendered

antiseptic by chloride of zinc solution and the free use of iodoform; a drainage of some kind should be inserted, and plenty of salicylic and iodoform wool used as an absorbent dressing; the whole wound should then be sealed down with collodion, and bandaged firmly to prevent displacement.

If brain symptoms have occurred, the above surgical measures are of the utmost urgency, and the practitioner should secure the aid of the surgeon, and go deeper and deeper still into the brain pan in search of pus; the diagnosis may be doubtful; suppurative meningitis may be limited and surgically curable. It is now well established that cases may recover from abscesses in the brain and cerebellum after surgical interference; the chance of recovery in any other way is nearly *nil*; if the parents refuse surgery, there is nothing to do except to treat the case as one of meningitis.

Otorrhœa entails a certain amount of deafness; the facial nerve may be paralyzed as a result of its continuance; the *preventive treatment* of otitis is most important; during any acute specific, but especially scarlet fever and measles, attention should be directed to the protection of the throat and ear from local cold and damp; if otorrhœa occurs in their course, it should be instantly treated by free and simple syringing, or the dry method. Cold and damp at any time, and from any cause, should be shunned when otitis or otorrhœa is present; a piece of absorbent antiseptic wool may be placed in the external ear to receive the discharge and protect from cold and damp, though not so firmly as to prevent the escape of matter; sea bathing should not be allowed.

Hot fomentations, poultices, anodyne oils poured into the meatus, leeches applied to the concha or mastoid, or counter-irritations by blisters or iodine are very good for the meatal inflammation, and may palliate the tympanal, for which there is nothing to equal the membranal incision; nature bursts the membrane clumsily, and with great suffering; the surgical knife is infinitely better, it relieves at once, and does not scar the membrane so much, and there is conse-

quently less chance of impairment of hearing; chloroform vapour has been recommended by Dr. Robb to relieve the pain of many ear affections; the vapour, not the chloroform, should be floated into the external meatus.

In cases of actual necrosis of bone, the employment of astringent or other lotions should be prohibited, as likely to set up mischief in cranial membranes and sinuses; it is a prime object of treatment to prevent such a sequel.

### HYDROCEPHALUS: CONGENITAL AND ACQUIRED.

The whole question of hydrocephalus requires reviewing. One solid fact appears to be ascertained—complete cessation of communication between the cerebral cavities and the subarachnoid space always causes hydrocephalus. Is obstruction at the foramen of Majendie, fourth ventricle or *iter a tertio ad quartum*, ever absent in internal hydrocephalus? Pressure on the vena Galeni and other veins, increased secretion from lining membranes, and deficient absorption, are conceivable causes. Congenital hydrocephalus may be associated with spina bifida. The circulation of cerebro-spinal fluid may be interfered with by meningitis and tumours, and, possibly, by hæmorrhages; cerebellar tumour often causes ventricular dropsy, because it is favourably situate for obstruction of the cerebro-spinal circulation. If there were no block, would not excess of secretion pass away? Deficient absorption would, probably, never be extensive enough to cause hydrocephalus; if there were deficient absorption from the internal surface of lateral ventricles, the fluid could still escape through the foramen of Majendie and be absorbed elsewhere; an excess of ventricular fluid by its centrifugal tension ought to arrest the secretion of fluid by diminishing the cerebral circulation; still such arguments may be fallacious; hydrocephalus should be frequently regarded as a symptom, and not the whole disease.

A certain amount of ventricular dropsy may occur in general dropsy from heart or kidney disease, and from anæmia in rapid wasting, also from pressure on the veins of the neck.

The symptoms of hydrocephalus are very variable; rapid wasting or fattening is a curious one—perhaps attributable to pressure on the centres governing metabolism, whose chief site is the floor of the fourth ventricle. Mental apathy, convulsions, tetany and laryngismus are not uncommon; atrophy or œdema of the optic nerve discs may occur; other symptoms are headache, giddiness, blindness, nystagmus, squinting, rigidity of neck or limbs, spastic paraplegia and various vasomotor disturbances. The diagnosis may be difficult at the outset; when the sutures give way the laity can diagnose safely "water on the brain."

**Treatment.**—*Pressure* may be employed to promote absorption and to compensate for the disturbed circulation of cerebro-spinal fluid; strips of diachylon plaister, or Johnson and Seabury's elastic plaister one inch wide, may be used; this practice requires caution; the pressure should be even and uniform; some employ simple bandaging; most of the strips of plaister are fastened on obliquely from one side of the occiput to the opposite side of the forehead, a few are placed horizontally from ear to ear; the whole are secured by a circumferential strap of plaister. Convulsions, syncope and even death have rarely followed such treatment.

*Absorption* of the fluid and of the materials causing the obstruction may be promoted locally by the inunction of mercurial ointment or iodide of potassium ointment—oleate of mercury is more cleanly—and internally by the administration of mercuric bichloride, or mercury with chalk in small doses, or iodide of potassium in large doses, or the two drugs may be combined. Except in syphilitic cases there is not much to be gained by this treatment.

*Removal of fluid* may be practised by paracentesis; all the instruments should be rendered aseptic; a very fine trocar and cannula should be used; they are passed into the lateral ventricle by puncturing the cleansed scalp about one inch to the left or right of the middle line, on a level with the site of junction of the sagittal and coronal sutures; repeated tapping has occasionally been followed by cure. The flow of fluid must be slow; as a matter of fact, with the fine cannula usually employed, the difficulty is rather to get a flow at all.

Dietetic and hygienic treatment consists in general carefulness as to food, cleanliness, clothing and fresh air; nothing special is required; wasting is sometimes very rapid; tonics of cod-liver oil and steel wine are valuable during convalescence and recovery, should this be the fortunate termination; there is considerable hope of recovery in syphilitic and some other cases. (See Cervical Opisthotonos.)

*Tabes nervosa* is a term applied to that condition of a child when it remains persistently languid and torpid, without being comatose and without there being any other sign of disease, either of the nervous system or other viscera. In one case, in a boy aged ten, which was labelled tabes nervosa by Dr. Gee, I found at a necropsy, very slight chronic meningitis in the form of mere opaque thickening, with moderate internal hydrocephalus; there was no tubercle, and the foramen of Majendie did not appear to be completely closed; there had been no history of sudden illness.

## EXTERNAL HYDROCEPHALUS.

Local atrophy of brain, the results of hæmorrhage into the arachnoid sac, and of inflammation of the dura mater is associated sometimes with some excess of fluid outside the cerebral cortex. Hemiplegia and Jacksonian epilepsy may be some of the symptoms when the lesions are local and in the motor region. Asymmetry of the skull or local thinness of

the calvaria may lead to a suspicion of the existence of local cystic collections. An excess of subarachnoid fluid may be seen after death, associated with general atrophy of brain; the diagnosis is often impossible.

The only method of treatment is the surgical one: tapping has been practised and repeated with success; trephining and thorough examination by a careful aseptic surgeon is probably the best if anything has to be done, and this even when the diagnosis is not certain, but only moderately probable; drugs are useless.

### INFANTILE PALSY.—ACUTE ATROPHIC PARALYSIS.

Infantile palsy is most common under the age of two years. An acute onset with fever, extensive but regressive paralysis and rapid wasting of muscle are very general features; the onset is not always sudden as a thief in the night; it may be two or three days before the paralysis reaches its greatest height and widest extent; recovery is seldom or never complete. The anterior tibials, peronei and deltoids are very prone to be permanently atrophied. The onset with fever and severe pains with tenderness has been diagnosed as rheumatism; some swelling of joints has been observed in the painful limbs, and vaso-motor troubles with sweating and even erythema, have been noticed, and have thus increased the rheumatic resemblance. Besides pains there may be spontaneous sensory disorders with feelings of numbness and tingling; it is not true that the sphincters are always avoided by the disease. The disease is a cornual myelitis in the great majority of cases, though thrombosis, hæmorrhage and embolism may cause the disease or cause the myelitis.

The reaction of degeneration, the loss of reflex action in the paralysed parts and the rapid wasting may be due to disease of the peripheral nerves; in neuritis the atrophy of muscle is more irregular in distribution, the onset is usually

more gradual, and there is usually coincident sensory disorder in the form of anæsthesia and continued pains. The febrile onset, which may be convulsive, may resemble the commencement of an acute specific. A cerebral convulsion may be followed by paralysis from fatigue or exhaustion of the motor cortex; the deep reflex action in the palsied limbs is usually excessive; the same fact holds good of cerebral paralysis from organic disease; the faradic reaction is not lost, nor is there rapid wasting of muscle. In infantile palsy the local loss of power is usually attended with loss of reflex action; the paralysis may not at first be noticed in the midst of the general prostration, thus baulking the diagnosis; at the end of a week the characteristic reaction of degeneration may be found; the loss to faradism is *the* test. The sound limb, if there be one, may be first tested to ascertain the lowest strength of current needed to cause contraction of muscle; the child may be placed under chloroform, if necessary; indeed, it is generally best to do so, both for the doctor's and the parents' sake; the loss of the knee-jerk in infantile palsy is a valuable sign; this occurs also in diphtheritic palsy and pseudo-hypertrophic paralysis; in hip-joint disease, disease of the femur, periosteal hæmorrhage and syphilitic pseudo-paresis, the jerk is generally good.

I have seen cases of cerebral palsy in which the knee-jerk and faradic reactions were lost for a day or two; in the first volume of the "British Medical Journal," 1889, I have suggested that rickets may cause spinal palsy with loss of faradic reactions, due to dynamic changes.

*Prophylaxis.*—The necessity for taking care of infants is borne out by the occurrence of infantile palsy; the etiology of the disease may not always be of the same nature; the summer sun should be shunned as much as possible, for the disease is more common from May to September, and there are grounds for believing that sunstroke is a cause; exposure

to severe cold and to wet or damp must also be avoided; this avoidance of excessive heat and cold is simply part of the general art of preserving the health of the nervous system. The effect of heat or cold, speaking generally, is greater on infants than others; boys often lie about on damp grass, and this procedure has been assigned as a cause of palsy as well as of rheumatism, and many other diseases.

Over-exertion in boyhood, over-walking in infancy, falls and blows should be prevented; that teething and infantile palsy go together is admitted; teething and rapid development of the nervous system are companions also; bad feeding and cold-catching disturb the nervous system quite as much as they disturb the dentition; great hyperæmia and tension about a tooth may be regarded as peripheral irritation of the central nervous system. Ingenuity of intellect has plenty of scope in discussing the influence of dentition on infantile palsy; all are agreed that any cause tending to disturb dentition or the development of the nervous system should be averted. Robust health, however, does not prevent this palsy; feeble health and actual disease are slight predisposing causes; the palsy may develop during the height of or after typhoid fever, scarlet fever, measles, bronchitis, pneumonia, ague, or diarrhœa; some of these fevers produce recognisable changes in the brain, cord and nerves, which changes may be of an intense inflammatory kind.

A febrile onset with convulsions, must be treated by rest in bed and a low diet; the actual convulsions may be treated by the use of the hot bath for ten minutes, so as to depress the activity of the circulation and to act on the peripheral nerves with a view of controlling the nervous centres.

Before paralysis has occurred the case may be obscure; diaphoresis by the hot bath, in which a tablespoonful of mustard may be placed, may do something to relieve the heat of skin and convulsions; and half-dram doses of liquor ammoniæ

acetatis, freely diluted, may also be administered. Paralysis demands perfect rest; anything which calls forth the activities of the spinal cord must be avoided at least for a week, when the onset was febrile and sudden; every muscular contraction—which may be excited by mere touches, by shakes of the cot, or disturbance of any kind—causes hyperæmia of the corresponding reflex spinal centres; this hyperæmia can only be harmful if our view of the pathology of the complaint be correct. Any movement altering the shape or position of the spinal column may do harm mechanically by jarring the inflamed cord, or by interfering with the flow of blood. Congestion of the cord is diminished by laying the patient on the belly, and this posture should be adopted wherever possible.

Whether drugs have an influence on the morbid process in the cord is difficult to discover, for there is such a remarkable and such a variable tendency to spontaneous subsidence and disappearance of symptoms. Liquid extract of ergot in ten-minim doses three times a day has been prescribed in the early stage to reduce the hyperæmia and the tendency to hæmorrhage. Hyd. c. Cret. gr. i. or ii. t.d.s. has also been employed; and belladonna in large doses; iodide of potassium is generally conceded to be valueless; aconite has been used in drop doses to control the initial fever.

Leeches, dry cupping, hot fomentations, mustard plaisters (prevented by muslin from acting directly on the skin), hot water bags may be used as counter-irritants, and may tend to relieve the congestion of the cord, seeing that the blood from the skin and other structures behind the spine goes into the same venous plexuses as the blood from the cord does.

Spinal icebags have been tried with a view to reducing hyperæmia by the cold. The bowels should be acted upon by a watery purge of ten or twenty grains of Pulv. Jalapæ Co.

*Local mercurial inunctions.*—Though there is no great tendency to the formation of bedsores, yet cleanliness and care of the skin should be seen to, by altering the position of the patient from time to time, by the use of water beds and by the removal of stale crumbs. Involuntary micturition

and defæcation require most careful and prompt cleansing of the parts, not only for the sake of the skin, but also for preventing impurity of the atmosphere.

When all signs of irritation and acuteness have passed away, say, at the end of two or three weeks, tonic treatment should be instituted. Iron, quinine, and strychnine are the most useful tonics; the last should not be given till decided recovery is taking place, for it undoubtedly leads to excessive action of the motor bulbospinal centres.

Massage I believe to be far more useful than electricity; the limbs must be kept warm and red at all costs; cotton wadding should be warmed before being applied; when the child goes out hot bottles should be taken in the perambulator or carriage; they must not be in contact with the limb; vasomotor and trophic disturbances may be set up in the paralysed limbs by excessive friction, with stimulating embrocations or by the injudicious application of heat and electricity; even simple massage seems at times to develop wheals like those of urticaria.

**Massage** systematically carried out is most important and most beneficial; it is useless to perform it perfunctorily; it should not be neglected once even now and again without some very obvious reason. On a leg or arm the following movements should be practised:—They should be taught to an intelligent mother or father or nurse; the movements should be made twice a day at least and for not less than twenty minutes; all the movements begin from below and work upwards—from foot to hip, from hand to shoulder. The child should lie down on a bed if the whole limb is to be massaged, or may sit on a chair or on the parent's lap if only the leg is to be done.

The first movement is one of squeezing and rubbing firmly, but not painfully, with the whole palm of one hand, grasping first one side then the other, or the whole limb at once if it

can be surrounded. The left hand should hold the foot whilst the right grasps and rubs the limb from below upwards; it is best to rub with the dry hand; neat's-foot or olive oil may be used if the masseuse or masseur has not attained the requisite skill; if the thigh and buttock are involved this firm rubbing should extend from the ankle up to the buttock; it must be done thoroughly.

The second movement consists in squeezing the muscles and skin between the thumb and forefinger firmly, not so as to give pain; all the movements should be done deliberately; the foot should be included in this movement; the fingers are to be placed under the foot or leg or calf and the thumbs in front; the soft parts are then firmly but gently squeezed out between the fingers and thumb; sometimes the balls of the thumbs accomplish this better; the muscles and skin should be flattened and widened as much as possible without giving pain, yet firmly and slowly; the movement commences at the foot, and gradually passes up the whole limb and should include the buttock.

The third movement is like the wringing out of sheets; the rubbing and squeezing are done neatly and completely round the leg, each hand working in the opposite direction; the grasping is effected by all the muscles of the operator's hand.

In cases of talipes equinus the most important passive movement of all is flexing the ankle joint; the right hand is placed over the front of the child's knee joint; the palm of the left hand is placed against the sole of the child's foot, and the foot is pushed up so as to bend the ankle.

The tapotement or beating should be practised on the whole surface of the limb from below upwards, and it should increase the hyperæmia already developed by the previous three movements; the front and back of the fingers are used alternately.

Finally, a gentle rubbing and friction is to be done all over

the limb both upwards and downwards, only the skin is to be acted upon; this soothes the stinging due to the tapping.

Clothing and bathing are important adjuvants and adjuncts to the massage. The limbs must be kept warm, and massage is one means to this end. Knitted woollen stockings, woollen overalls outside these and reaching all up the limb are necessary; and a lining of cotton wadding to the stockings if they are insufficient to keep the limb warm; for the night time a flannel cotton-wool-lined "cosey" made to the shape of the limb and reaching from toe to hip is very serviceable. Closely fitting fur-lined garments are good.

As to the baths, a large pitcher of hot water (105° F.) containing two handfuls of salt, or Tidman's sea-salt, should be poured down the leg and thigh twice a day after the massage; this should be followed by a similar quantity of cold water poured over the leg and thigh. And, finally, the limbs should be rubbed thoroughly dry with a heavy but soft towel, and the rubbing should be continued until the limb is perfectly warm, when it should be immediately wrapped up as directed. To be effectual these movements must be systematically employed.

The *constant current* is useful by causing contraction and congestion of muscles and hyperæmia of the skin; warmth and nutritive changes are promoted, as by massage, though I think systematic massage more valuable than electricity. Electricity fails to arrest the rapid wasting of muscle; the faradic current may be used to those muscles which respond to it. Those muscles will recover if they retain the faradic reaction during the stationary period of the case; it is an interesting fact that the voluntary impulse may pass along a nerve in which faradism has not yet recovered the power of causing muscular contraction.

The strength of the constant current should be very slight to commence with, for it often in infants and children causes

emotional excitement, with severe screaming which can only exhaust the nervous system. By gradually accustoming the child the strength sufficient to cause cutaneous hyperæmia and slight muscular contractions will soon be attained, and should not be transcended.

Large poles should be used and composed of well wetted big sponges ; the positive pole is the stationary one, and should be pressed close to the sacrum or lower part of the back when the legs are to be galvanized, or to the back of the neck when the arms are to be done; the negative sponge is stroked up and down and over the whole surface of the skin; make and break of the current are thus effected gradually, and do not cause much pain. The child may be accustomed to the novelty of the procedure by not using any electrical current at all at first, but merely playing with the warm wetted poles ; the electrical treatment may be begun three weeks after the onset of palsy ; it should not be employed before this time lest the cord congestion be increased, not only by the electrical stimulation, but also by the emotional excitement. Those muscles which do not respond to faradism are the ones in which contraction should be caused by the use of the constant current. In other parts of the limb the hyperæmia of the skin and muscles is all that is required. Should the paralysis have involved the trunk muscles, constipation may prove troublesome; if the muscles of the chest and back be paralyzed, a mere catarrh of the lungs may be a source of danger ; in these cases care should be taken to avoid catching cold by carefully covering the cutaneous surface of the throat, chest and belly with flannel or warm woollen material.

The proper performance of massage will do much to prevent the development of muscular contractions, club feet and wasting of bone. The employment of weight extension by stirrup and straps of plaister may prevent the flexion of the thigh on the belly and of the leg on the thigh.

The employment of passive extension and a Scarpa's shoe may tend to overcome the talipes equinus; mechanical appliances are valuable only when they enable the limb to be used.

The one great object of the doctor, of the parents and of the child should be to use the muscles as much as possible ; any few fibres of a muscle, which is for the most part atrophied and paralysed, may be hypertrophied and developed by constant use, not carried to the fatigue point. Moreover, a vast amount of benefit often results from compensatory hypertrophy of other muscles; this compensation may be so considerable that positive wonders may be effected; it is useless to give casual instructions; the doctor should be earnest and serious in his manner of dealing with the case; he should explain the chronicity of the affection to the parents, he should adopt an attitude of optimism whilst insisting on the incessant and sedulous carrying out of treatment; the limb *must* not be allowed to become cold and blue; the massage *must* not be neglected, nor the passive movements, exercise nor electricity. Tenotomy may be necessary and also mechanical appliances; for these important measures orthopædic works should be consulted.

Strychnia (gr. $\frac{1}{100}$-$\frac{1}{20}$) has been injected under the skin and into the muscles of the paralysed limb; this method may be used without obvious benefit; the injection may be made daily or every other day; I regard it as trifling in importance and not worth the risk of causing local disturbances.

Belton Massey advises blisters in the initial stage over the small of the back when the legs are affected; or at the nape of the neck when the arms are involved; revulsives have been applied to the affected limbs; this, in my opinion, should be done with the greatest caution, for fear of inducing trophic lesions; when the blistered surfaces are healed the gentle, constant current should be applied over the back for two or three minutes, the poles being placed close together, the positive being above the negative; the current should be interrupted by the commutator, so as to cause contraction of the spinal muscles; actual vesication should be avoided.

Nitrate of silver gr. $\frac{1}{8}$ t.d.s., in pillule, for a child a year old, has been lauded by some; care should be taken, because an ounce of any silver salt will produce pigmentation of the skin in an adult. Minute doses of strychnia, gr. $\frac{1}{200}$ in pillules, twice or thrice a day, is said to have completely cured in a few weeks cases that resisted all other treatment; which may be strongly doubted.

## BELL'S PALSY.—FACIAL PALSY.

Pressure of instruments during delivery, "rheumatic," inflammation from local action of cold, as in riding in a draught in a railway compartment, inflammation associated with otitis or otorrhœa, are important causes of total facial palsy in childhood; the symptoms are precisely the same as in the adult, including the reaction of degeneration if the case is severe. This reaction is not always observed in the rheumatic cases, which may recover before any loss of reaction to faradism occurs; the first two kinds are favourable to recovery; recovery never follows the last form when there has been severe ear disease. I agree with Dr. Gowers in not having seen palatal palsy in association with paralysis of the facial nerve; it is very doubtful whether the petrosal branches of the facial nerve supply the palate.

Facial palsy from forceps pressure does not need much treatment; the face should be carefully protected as in every infant; galvanism can rarely be needed for it, since it usually subsides spontaneously, as a rule, in less than a week.

Rheumatic paralysis should be treated by the constant current, by protection of the face from cold, by stimulant embrocations, care being taken not to overdo them, and by gentle massage along the course of each muscle. The positive pole of the constant current should be placed on the nerve trunk over the ramus of the jaw, and the negative should be stroked about the face. The strength of the current should not exceed one microampère, at all events at first; if the muscles act to faradism this may be used of the

weakest strength necessary to evoke contraction; there is no risk whatever in treating such cases in children with faradism from the first.

### IDIOPATHIC MUSCULAR ATROPHY.—PSEUDO-HYPERTROPHIC PARALYSIS.—DUCHENNE'S DISEASE.

Boys are chiefly affected, and frequently more than one boy in the family; yet the disease is usually transmitted, like hæmophily, through the mother; the disease may have commenced during the first two years of life, though usually later, even as late as puberty, which is rarer still. The hypertrophy of muscles is due to an overgrowth of the fatty and fibrous interstitial tissue; the disease is essentially an atrophy of muscle, a myopathy, not a neuropathy. Cold and damp and acute specific fevers should be avoided, since these act as exciting causes. The difficulty in walking, and especially in going upstairs is a marked symptom. The small size, absence, or atrophy of the latissimus dorsi and lower part of the great pectoral has been insisted on by Dr. Gowers; my own experience of ten cases corroborates this.

The pseudo-hypertrophy attacks chiefly the calves and buttocks, the deltoid and spinati; the mode of rising from the floor and walking in a fairly marked case are almost pathognomonic; congenital spastic paraplegia may be mistaken for pseudo-hypertrophy, for the constant spasm causes considerable hypertrophy of the calves and legs; in the spastic disease the knee-jerks are excessive instead of being weak or lost; the mode of rising from the ground is not the same, and the tendency for pseudo-hypertrophy is not to get better, which is the opposite of what happens in the spastic disease.

Cases of idiopathic muscular atrophy occur in juveniles without hypertrophy; the face may be first atrophied in these cases—"myopathic face"—which is not the case in pseudo-hypertrophy; the two kinds do not occur, as a rule, in the

same family; harpooning the muscle by means of a Duchenne trocar with a view to detecting fatty and fibrous overgrowth is not absolutely trustworthy. The **treatment** is not encouraging; the chronicity of the complaint makes a belief in temporary arrest by the means employed easy to establish; I have employed faradism and galvanism, but without appreciable result. The mode of using these agencies is described under Infantile Paralysis. Massage and gymnastic exercises are perhaps the best means for endeavouring to strengthen the muscles which have not yet been involved, and also as tending to improve the whole system; these measures are powerless to prevent the muscular atrophy. "It is possible that (exercise) may, to some extent, divert the trophic energy from the interstitial tissue, since cessation of muscular exercise is certainly followed by quicker failure of strength" (Gowers). The passive movements, massage, and exercise are useful also in lessening the tendency to spinal curvature, talipes equinus, and other deformities and muscular contractions. Tenotomy of the tendo Achillis may be employed if the foot cannot be placed flat on the ground after a course of massage and passive extension. Tenotomy may restore the power of walking for some years, and when contracture returns its removal has a second time set the patient on his feet again.

When the back and chest muscles are wasted, the danger of pulmonary catarrh is increased; great care should be taken to prevent the patient from catching cold; every hygienic measure which tends to improve the general health, and the health of all the organs of the body, should be adopted with the utmost obtainable efficiency; special care will also be required in the treatment of any intercurrent affection which may arise. Arsenic and phosphorus may be prescribed as for Rickets, but neither they nor any other drug has any appreciable influence on the disease.

**Hereditary Ataxy** occurs in children. Many members of the same family may be affected; the age of onset varies; puberty and second dentition periods are common times for the commencement of the disease.

Tabes dorsalis and lateral sclerosis, Menière's disease and even a form of angina pectoris do occur in children.

# CHAPTER XVI.

## ACUTE SPECIFIC FEVERS.

### GENERAL TREATMENT OF FEVERS.

Pyrexia profoundly perturbs the physico-chemical processes of protoplasm; the nature of the perturbation is but imperfectly known, though the thermogenetic centres and tracts doubtless control the situation; the therapeutist may influence the loss of heat from the skin and lungs, or he may act directly on the nervous controllers of thermogenesis.

The removal of all restrictions to the action of the various functions of the body is essential; husband the vitality by allowing the nervous system, heart, lungs, arteries, liver, kidneys, bowels and skin to act adequately to the occasion, keeping the expenditure of energy at the lowest possible pace.

Consequently all cases of fever are best treated by confining the child to a cot in a capacious chamber at the top of the house, with a single nurse, who must be capable, of good physique and pleasing presence, and whose dress should be agreeable to the child, and composed of linen or muslin. A large fire in the room secures ventilation; as it is apt to create currents of air which cause unequal warming of the room sanitary stoves will doubtless displace open fires in the scientific future. The temperature of the room should be maintained day and night at about 63° F., because a uniform temperature makes the least demands on the various functions of the body; the heat-regulating machinery is thrown out of gear in fever. Abundance of fresh air, not too moist nor too cold, aids the action of the emunctories by oxygenating the hæmoglobin sufficiently and by carrying away from the

body the various volatile emanations. The air must not be fouled by the chemical, physical or vital emanations or evacuations of the child or nurse; everything in the room and about the child must be scrupulously sweet and of such material as will bear being cleaned; the furniture in the room should have plain and smooth surfaces, so as to allow of washing.

The objects of cleanliness are to lessen contamination of the atmosphere, to promote perfect perspiration and aëration of the blood, and to prevent poisoning of the atmosphere on which the patient has to live. The child fouls the bed and bedding by volatile, particulate and visible emanations and evacuations. This fouling interferes with the perfect performance of the protoplasmic processes, since such emanations and evacuations require a certain amount of expenditure of energy to enable the child successfully to resist their deleterious action; to live in such an atmosphere is not so easy as to live in a germless untainted pure air, such as may be got on the sea or at mountain heights. In fevers, as in other illnesses, restrain every influence which increases the demands on or interferes with the vitality of the child. Whilst one cot is being cleaned and aired another may be in use; no superfluous furniture; no curtains or carpets; dirty linen soiled by vomit, stools or sweat, plates and dishes, should be sent away as soon as possible; foul linen and napkins should be steeped in antiseptics; absence of noise is nearly as important as absence of dirt and foul air; noise discharges, *i.e.*, wastes, the energy in the cerebral cortex and other nerve centres; and probably acts disadvantageously on the other processes in the body, as in causing palpitation, restlessness, sweating, etc. The child must be diverted without being excited, for excitement increases fever when it is present, and depresses vitality at all times.

The bed should have a tolerably firm mattress; feather

beds should not be used; crumbs must not be allowed to get between the sheets; care must be taken to avoid long-continued pressure and irritation of the prominent points; a good nurse always prevents bed sores, which do not readily form in children, owing to the vitality of the tissues, but constant cleanliness and care should be exercised all the same; the bed should be of fair size to allow of plenty of room if the patient be restless; the bed clothing should be changed as frequently as may be necessary to keep it sweet and clean; the mattress and palliasse may be exposed to fresh air and sunlight, and in order to disinfect it may be baked in a proper disinfecting stove at a temperature of at least 212° F.; the importance of proper drying and airing of all the bed linen and child's linen should not be forgotten; the bed covering should be light, not to prevent the escape of heat and emanations, at the same time sufficient to prevent unequal chilling of the surface or a feeling of coldness; excessive light should be guarded against by plain shades and inside venetian blinds or shutters; light, especially the actinic chemical rays, increases metabolism—an action to avoid as much as possible in fever. The nurse's clothes should not be of woollen material, which entangles bacteria, germs, particles of epithelium, and is, therefore, less easily disinfected than linen or muslin; the furniture above recommended is easily disinfected owing to the absence of nooks and corners; the cot may be of iron or hard wood, which can be easily kept sweet and clean; have basins of disinfectants about the room and a sheet damped with 1 in 40 carbolic acid hung over the door; if these effect no actual destruction of germs they serve at least to remind one of the necessity for cleanliness and for isolation from other people; a grass mat or two on the floor looks more comfortable than a bare board, and can be readily disinfected. The duration of quarantine is indicated under each acute specific fever. Wherever possible send infectious diseases to

the London Fever Hospital, Liverpool Road, N., or some similar institution in the country; the Mary Wardell Convalescent Home for Scarlet Fever is at Brockley Hill, Stanmore, Middlesex; for hospital patients the ambulance of the Metropolitan Asylums Board may be wired. After the expiration of the appointed quarantine period the child should be bathed and washed with carbolic soap, and leave all his presumably infected clothes behind him as he leaves the room; some well-aired, perfectly fresh and clean clothes should be ready in an adjoining chamber.

The apartments or ward which have been thus vacated must be thoroughly fumigated by burning sulphur after closing doors, windows, chimneys and other openings; an ounce of sulphur for every cubic metre of space; the furniture should be washed with strong solution of chloralum (3 ozs. to gallon) or with carbolic acid 1 in 40; the floor should be scrubbed with carbolic acid soap; all wall papers should be torn down and burnt; free ventilation should be obtained after the fumigation; all the ceilings and walls should be washed with quick-lime and whitewash; the walls should be eventually repapered; all wood-work should be cleaned with carbolic soap; everything washable should be steeped in solution of chloralum or carbolic acid and boiled; if washing is impossible disinfection is best done by dry heat for several hours in a public hot air disinfection chamber at a temperature of 250° F. Articles of trifling value, such as rags, etc., should be completely burnt; linen and fast-coloured clothes may be hung up in the sulphurous acid fumes.

Epidemics in schools require the existence of a quarantine ward, which should be kept sweet and clean, well warmed and aired; all the children should be carefully watched and their temperatures taken night and morning; isolation in an isolation ward should be practised on the appearance of any one symptom.

**Antipyrexia** in childhood.—Sponging the surface of the body with cold (60°) or tepid water (80°) is the best and gentlest method for children, who, however, bear great heat better than adults; there should always be a mackintosh beneath the under-sheet, or beneath the under-cover in every child's bed; the sponging may last from five to fifteen minutes at a time; the temperature is best taken in the rectum of infants, and in the mouth of older children if nothing prevents; the water may be used much colder than above mentioned, and may even be iced, especially when the spongings are applied to the head, or the parents seem to object to an actual cold bath; the whole body may frequently with advantage be immersed in a bath of which the temperature may be 95° at first, and gradually reduced to 70°; careful medical superintendence of these practices is needed.

Shivering is an indication for removal of the child; as a rule the temperature of the bath should not go below 60° unless the (rectal) hyperpyrexia prove obstinate; remember that the body temperature goes on falling for a half-hour or so after removal from the bath; ten minutes in such a bath is an outside time; the child should be rapidly dried; it may sometimes be necessary to put it between blankets; the bed-clothing should be as light as is consistent with circumstances; after the cold bath the temperature must be closely watched, the thermometer being used on the slightest indication; the temperature should always be taken at least every four hours; when hyperpyrexia is about, every two hours, or even every hour; the effect of the bath is often decidedly depressing, the resulting cyanosis and collapse may be considerable and lasting; the extremities may then be wrapped in cotton wool, and hot bottles used; hot grog is useful, ʒi. of brandy in warm water or milk; it may be necessary to give *stimulants* before, during and after the immersion; the cold bath, though a valuable method, requires care and judgment in children

more than in adults; the number of functions on which it acts and the profundity of the peripheral impression on the neuro-muscular apparatus are very great. Another useful way of reducing fever is the *water-bed* on which the child is placed, a sheet or blanket only intervening; the child may lie on its back or belly; a stream of water may be kept flowing through the water-pillow or bed; the method requires care and attention.

The *wet pack* is very useful in abating fever and restlessness in children; the cloth may be wrung out of cold or tepid water; the child is swathed in it, then blankets are wrapped round the sheet-enveloped child; the pack should remain about fifteen minutes or less in an infant; modifications of this system may be used locally; cloths wrung out of iced, cold or tepid water (compresses) may be applied to various parts of the trunk, and may cover a certain area at a time.

Thornton's cap or an ice cap may be used to the head as an antipyretic; if Leiter's leaden tubes are used as they may be to the head, throat, chest or abdomen and joints, the water circulating through them should not be iced, unless a very powerful effect is wanted; the lead acts as a conductor of heat and the part cools very rapidly.

*Intestinal irrigations* even of iced water are also employed; they are highly praised, especially in acute inflammatory diarrhœas; a Maw's irrigator may be used, or a small cistern with a syphon arrangement. (See articles on Diarrhœa.)

Five-grain doses of *quinine* may be given at long intervals, as an antipyretic in children; some give two-grain doses frequently; it may be given as a suppository. Ten-grain doses of salicylic acid may be given every hour as an antipyretic to a child seven years old; if there is cardiac debility or albuminuria it should not be used; it cannot be recommended under any circumstances.

*Antipyrin* is much used nowadays; ten grains or more may be given with caution to a child seven years old; or a grain for each year of the child's age; it sometimes has a depressant action on the heart as well as on the nervous system; vomiting may be excited by it; sweating generally and a morbilliform or scarlatiniform rash not of serious import sometimes follow its administration.

*Antifebrin* has also been employed; four grains in one infant (Bernheim, age not stated) caused collapse and shivering, lasting two hours; two grains is the usual dose for a child of five; antipyrin, antifebrin, salol and salicylates are most useful in painful acute pyrexial rheumatism, which is rare in children.

*Kairin* has been used to reduce the temperature in typhoid fever, pneumonia, scarlatina and other fevers; its administration requires caution; collapse has followed its use; the dose is three grains to a child five years old; it may be cautiously increased in amount; the pulse and respiration fall as well as the temperature, and sweating follows; the reduction of temperature varies in different cases; it is seldom more than three degrees F.; the general opinion, in which I concur, is that it is of but little value. *Thalline* has an antipyretic effect which does not last long; a few grains may be given in a watery solution; it seldom causes nausea, vomiting or diarrhœa, yet the sudden fall in temperature may be ushered in by cyanosis; and profuse sweating may ensue; it will probably not continue to hold a place in children's therapeutics.

*Universal inunctions* of mutton fat, cerate, lard and vaseline, have been tried for the reduction of pyrexia; in young infants their effect appears to be greater than in older children; the fall is seldom more than two degrees in any case; the practice is a good one notwithstanding theoretical considerations. The balance of advantage as against dis-

advantage seems to be in favour of the former; what may act advantageously on one corporeal apparatus may act deleteriously on another. The method is inferior to the application of cold. The mere friction may do almost as much good as the inunction; it is certainly soothing to the sensory apparatus.

**Food in fever in childhood.**—During fever the food must be unstimulating and mostly in a liquid form, but all the proximate principles of food should be supplied; the largest possible amount of surface is thus presented to the action of the gastric juice; the feeding should be done "little and often," as this taxes the neuro-muscular and secretory apparatus of the stomach and duodenum least; it may be necessary to peptonise and malt the foods; mutton broth and beef tea containing proteids and hydrocarbons, but little carbohydrates, should be thickened with well-boiled or baked flour, Savory and Moore's food or better still with Mellin's soluble food; milk may be too heavy alone; its casein may be guarded by isinglass, gelatine, gum acacia or the time-honoured barley water; if beef tea causes diarrhœa, chicken broth, veal tea or vegetable soup—all carefully strained—may prove invaluable as in typhoid fever, and in scarlatinal albuminuria, in which disease the pure animal broth may be too irritating to the bowel and kidneys.

*Stimulants* are not always needed in the treatment of fevers in children; a bad type of the epidemic of fever or low vitality of the child calls for stimulants at the outset. There is no hard and fast rule as to the amount of stimulants. A disproportion between the pulse and temperature, *not due to removable nervous excitement*, is as a rule an urgent summons for stimulants; a tongue tending to dry or a skin to sweat, at the outset of a case; coldness, dampness and blueness of surface and a depressed fontanelle usually constitute a demand for stimulants. Good brandy and port wine are the best

stimulants; they should be given with soda water, milk or water; the quantity needed varies with the case; half-a-pint of champagne or six ounces of high-class brandy, whisky or wine may occasionally be required in twenty-four hours even in children only a few years old.

Insist on cleanliness of the most aseptic description for the child's external environment; the same principles apply to its internal environment.

The mouth and fauces must be cleansed every day at least with tepid water and a soft tooth brush; it is a good plan to have the mouth rinsed out after each meal; the rectum must be cleared every day as a rule, with simple enemata; rectal irrigation with an Eguisier syringe is indeed excellent and has been used as an antipyretic, very cold water being employed. Of the necessity for keeping the skin clean perhaps enough has been said; when there is much perspiration change the linen more even than once a day; care should be taken to see that the linen is dry, clean and well aired; linen is better than flannel during the active period of most fevers, unless sweating is copious; during convalescence a woollen vest and a belly protector should be worn.

## SCARLET FEVER.

*Isolation* is very effectual in preventing its spread; the patient may not mix with others till all desquamation has ceased; this means six weeks' isolation at least; the stage of red eruption is probably also a contagious period.

Scarlet fever affords a striking instance of idiosyncrasy; some protoplasms are more liable to it than others; robust health (see Typhoid Fever) may even predispose to it; it is a potent predisposer to nervous diseases, not always of organic sort; epilepsy is frequent after it, and may be rendered worse by it, if present before; contrast this with typhoid fever, which frequently does the opposite—removes a neurotic

tendency, disperses chorea and even epilepsy; the whole nervous nature is sometimes changed by scarlatina and typhoid fever.

Scarlet fever comes out within a week of exposure to the infection thereof; surgical scarlatina may be of but a few hours' incubation. The *diagnosis* of scarlatina is not as a rule difficult: Sudden onset, vomiting, high fever (103° F.), rapid pulse, punctiform, uniform rash within 48 hours, strawberry tongue, sore throat and large glands are sufficiently characteristic in a typical case. Simple sore throat, simple erythema, rötheln, measles, diphtheria and ague are stumbling blocks in atypical cases. Some pyrexia is necessary to the diagnosis, unless in the malignant variety, in which severe cerebral symptoms: coma, convulsions and collapse and a mottled blue skin, usually terminate fatally in a few hours. Surgical erythema is almost certainly scarlatinal.

A *membranous sore throat* may occur in scarlatina; the œdema of the soft palate and fauces sets in soon and makes the parts look gelatinous and translucent; the sudden febrile onset usually puts diphtheria out of court; simple membranous or follicular tonsillitis may cause a difficulty, these ought never to have a bright red punctiform rash, and seldom a diffuse erythema. Drugs may cause curious consternation; such as copaiba, the resin of which in the urine is precipitated by cold nitric acid, which heat and alcohol dissolve.

The **treatment** of the simple forms of scarlatina is simplicity itself; the carrying out of the treatment described on pp. 467-70 will suffice; a very rapid pulse in scarlet fever unless accompanied by other signs of serious import is no call for stimulants; typhoid fever, on the contrary, may produce quite a slow pulse with high fever.

In scarlatina anginosa, the greater fever and more troublesome throat require careful watching, attention, and expec-

tant treatment. The treatment of scarlatina is considered under various headings; the remedies and methods that I prefer and recommend come first in each section.

**Prophylaxis** consists in the avoidance of all cases of scarlatina and all neighbourhoods in which the fever is rife; all water should be boiled, and all milk; increasing evidence shows that milk is a striking source of conveyance of the disease; the exposure of milk and water in the scarlatinal sick room is to be prevented, since germs and epithelia may fall into these liquids; the cow may be the original source of the disease.

**Food and stimulants.**—A supporting plan of treatment is always called for in well-marked scarlet fever:—Strong beef tea, milk, meat essences and extracts, brandy, eggs, eau albuminense (whites of two eggs, half-a-pint of cinnamon water, a little sugar), mutton broth, jelly, blanc mange, &c. The liquids should be thickened with soluble carbohydrate, preferably Mellin's or well-boiled Savory and Moore's. Frozen beef tea or milk is good when the appetite is poor, the mouth hot, and thirst distressing. The early appearance of the typhoid state should be met by free stimulation; it is a grave sign.

Great swelling of the neck, large hard parotids, and a plastron of brawny infiltration; or a sloughy throat interfering with deglutition and even respiration—may be rendered less distressing by hot and numerous poultices and by glycerine of belladonna paintings. Plenty of brandy and champagne are usually required; and the patient may have to be fed by the nasal catheter and by nutrient enemata and suppositories; bleeding should on no account be practised.

**Topical treatment of throat and nose.**—Relief of thirst and of the sensation of dryness may be obtained by ice or iced water, small quantities of acidulated not sugary drinks, such as lemonade, orangeade, acetade (very dilute acetic acid),

raspberry vinegar and water, freely diluted sulphuric acid, or hydrochloric acid, with a little glycerine; these are refrigerant also; a little glycerine and honey with borax applied from time to time give relief; effervescing draughts of soda water, cold carbonic acid water, certainly give great comfort sometimes; bear individual peculiarities in mind (see p. 3).

Accumulations of sticky mucus about the throat may be alleviated by the above means, and by steam inhalations which are nearly always used under a tent when the throat is bad; heat and moisture with ventilation may be secured as in severe bronchitis; carbolic acid, terebene, sanitas or eucalyptol may be used as sprays.

Nitrohydrochloric acid, very dilute and sweetened with honey, is recommended by Waring for gargling and internal administration.

*Nasal discharges* should be treated by greasing the nostrils and upper lip so as to prevent excoriation; scrupulous cleanliness should be maintained by the removal of all secretions; scabs should not be allowed to form; oily preparations, not water, ought to be used.

The *nasal passages and nasopharynx* require as much attention as the *throat*.

Syringing or douching with dilute antiseptics, such as Condy's fluid, chlorine water, or chlorinated soda, checks and sweetens the secretions and relieves diarrhœa. Sprays (steam or hand atomisers) or, if possible, gargles may be used instead, both for the nose and throat.

Sanitas, carbolic acid 1 in 50, terebene 3i. to ℥i. of water with 3i. of spirit, resorcin and carbolic acid may be tried, as in hooping cough; lime water or solution of salt (3i. to Oi.) may be used as nasal douches; these soften the mucus and matter and aid in the removal of crusts; they should not be practised to the extent of exhausting the child.

Insufflation of iodoform, as a cleanser, deodoriser and antiseptic, is best when other means cause struggling. Finely-powdered iodoform may be blown on to the throat and into the nose by Mayer and Meltzer's instrument; or an

ointment of gr. xv. to ʒi. of vaseline or geoline and a dram of eucalyptol, may be put far up the nostrils with a camel's-hair brush; when there is much weakness glycerine preparations or mere dusting with powder cause less disturbance, and have a more prolonged effect because they adhere to the parts.

Inhalations of sulphurous acid have no special advantage; the vapour of acetic acid has been used for the throat, but is of no special value; alum gargles (gr. x. to ʒi.) and sprays are useful, but no better than other agents; gargles of tinct. of capsicum ʒi. to Oi. may be of service in the relaxed state supervening on the acute. A solution of Ferrous sulphate ʒi., glycerine ʒiii., may be employed with a brush as a local application to the throat (Lewis Smith). A gargle of acetous infusion of sanguinaria, ʒss. of the fresh root to Oi. of vinegar, is recommended by Jennings. Boroglyceride or boracic acid and glycerine is a useful antiseptic for the nose and throat; it may be applied with a brush or mop. *Escharotics* are not recommended as a rule; strong nitric acid, applied to the sloughs in the throat, can seldom be required; hydrochloric acid and the solid stick of nitrate of silver have been successfully tried.

*Severe cerebral symptoms* and *malignant forms of scarlatina*.—For the malignant forms, with collapse, coma, convulsions, hæmorrhages and purpura, no good remedy has been found. A hot mustard bath (100° F.) should always be tried and repeated; cold water affusions to the head are good; bleeding cannot be recommended; teaspoonful-doses of yeast frequently repeated have been highly commended in malignant cases; they should at least be tried.

Compression of the carotid arteries has been recommended for convulsions: the right artery when the left side is convulsed, or both alternately when the convulsions are bilateral; it seldom effects any good; whether blood-letting by venæsection will ever again be practised must remain an open question; never practice depletion by blood-letting; no, not even a few leeches for the throat; it would be powerless to save the malignant cases, and could only weaken in others.

Tincture of veratrum viride (♏v.) or veratria gr. $\frac{1}{12}$, to lower temperature and control convulsions, would require careful watching; it acts like aconite, but seldom does good.

**External applications to throat.**—Poultices are best when the throat is sloughy and there is much swelling interfering with deglutition

and respiration; they should be frequently renewed, though they only give comfort.

Cold wet compresses may be used when the swelling is not great; hot fomentations are equally useful. Slices of salt pork sewn to a single fold of linen and put to the throat from ear to ear, the band passing over the vertex, with camphor powder and salt sprinkled on the pork to increase its irritant action, are said to be good (Lewis Smith and Leuf). Local applications should be renewed frequently, say every two hours, and care must be taken to prevent chill during their removal and re-application.

**Abscesses or suppurations** require immediate resort to the surgical knife; they must not be allowed to burst spontaneously; even extensive suppuration and sloughing may be recovered from; all instruments employed in the opening of abscesses should be thoroughly cleaned and rendered as aseptic as possible; aseptic methods are always advisable.

**Chronic ulceration of fauces and pharynx** may remain; it is best treated by change of air, good food, digestible nutritious diet and a little wine or claret with the dinner. The ulcers should be kept sweet and clean by syringing or gargling, and occasionally stimulated by a solution of nitrate of silver gr. v. to ʒi. distilled water, applied by means of a camel's-hair brush.

**Bleeding from throat.**—Sloughing or ulceration at any time may lay open a large branch of the external carotid artery; small hæmorrhages may be controlled by ice and local pressure, or by local styptics; perchloride of iron on a mop of cotton wool is best. The common or external carotid artery may have to be tied; pressure on the common carotid in the neck may control the hæmorrhage, but local pressure should preferably be employed.

**Balneology** is practised to reduce pyrexia; to bring out the rash; to remove collapse; to relieve cutaneous irritation, restlessness and delirium. Sponging the skin with tepid water is effectual in relieving the cutaneous irritation, abating the pyrexia and bringing out the rash. A more powerful

means for effecting all these changes is the cold wet pack.

The cold douche may be used for hyperpyrexia; it should not be used when there is profound collapse with blue skin and a feeble heart; for this state the hot mustard bath should be tried; cold affusion or a Thornton's cap to the head often controls hyperpyrexia.

Hot baths (100°) should be used once a day to promote desquamation; they are recommended also in the early stage of dropsy; the child should be removed from the bath and wrapped in a large sheet to prevent chill; sponging the skin with dilute acetic acid, with a view to preventing the spread of fever to others, has no special advantage over plain sponging; hot air baths promote diaphoresis when the skin is hot and dry; they are valuable in uræmia.

**Internal remedies.**—Iron is the best tonic.

℞ Tinct. Ferri Perchl., ♏x.
Glycerini, ♏xx.
Aq., ʒii. t.d.s.

for a child of three. It strengthens the constitution, improves the blood and promotes the healing of the throat.

*Antiseptics* are less valuable, but require further investigation; ten minims of chlorine water may be given every six hours to a child of five; five-grain doses of sulpho-carbolate of sodium or hyposulphite of soda several times a day; they are useful occasionally, but have more action over septic than scarlatinal processes.

*Antiphlogistics for the throat* are highly praised by some; aconite tincture given in drop-doses frequently has not any special value in scarlatina. Hyd. c. Cret. gr. ½, or Calomel in fractional doses, given every hour, for great swelling of the tonsils and to convert malignant into simple sore throats, is of no value in my belief.

Aconite is of value however in great excitement of the nervous system and circulation associated with a dry skin; it soothes the nervous symptoms, and favours sleep by its diaphoretic action; Dr. Ringer avers that aconite controls inflammatory complications, but he rightly doubts whether it can lessen the severity or diminish the duration of the

fever; he advises its employment if any rise of temperature occurs during convalescence; I prefer the wet pack to aconite.

*Alterative* (?).—Chlorate of sodium (gr. iii.), with dilute hydrochloric acid and honey, syrup or glycerine, may be used instead of chlorate of potash (gr. iii.); it is preferable to the potash salt; I do not use them in scarlatina except as gargles; I believe their prolonged use may lead to anæmia and hæmorrhages; undoubtedly, large doses may cause hæmaturia, albuminuria and cardiac depression; some prescribe the chlorate as a drink, and prize it highly as a cleanser of the tongue; others say it is most valuable at the end of the disease.

*Antipyretic* drugs.—Quinine may be given in full doses, and is perhaps the most useful; antipyrin in five-grain doses, frequently repeated, for a child five years old, may cause collapse. (The admixture of it with sweet spirits of nitre causes the development of aniline blue.)

Some recommend digitalis to be prescribed with antipyrin; their action on the heart is said to be antagonistic, though it is doubtful whether antipyrin always acts as a cardiac depressant. Benzoate of sodium and salicylate of sodium in ten-grain doses for a child of five, are recommended; some prefer the former; neither is of much value in my experience; it is averred by some that the former is a *safe* antipyretic; the doses may be repeated every hour; their effect should be carefully watched; salicylic acid in five-grain doses has been used.

For *remedies to relieve restlessness*, see the paragraph on Balneology; bromides in five-grain doses, with or without chloral in similar doses, made palatable by syrups, may be prescribed for children seven years old; they require careful watching; smaller doses should be used for younger children, but both drugs are, as a rule, well borne.

*Pulse indications.*—Feeble circulation and delirium: Carbonate of ammonia (gr. ii.) or solution of acetate of ammonia ℥x. every six or eight hours; these are useful, and may be given in milk. Soft and feeble: Sir Thomas Watson prescribed half-dram doses of solution of citrate of ammonium frequently. Digitalis is employed by some in large doses when the temperature is high and the pulse rapid and irregular in a weak child; it should be prescribed with caution in doses of a few minims of the infusion or tincture.

*Specifics, curatives,* and *prophylactics.*—Belladonna is useless as a specific, though a few still cling to it; bromides may prove serviceable to secure rest, but I do not believe they have any specific action on the scarlatinal throat; tincture of capsicum internally in two-minim doses can only be of value in convalescence; carbonate of ammonia is useless

as a specific (see above); alkaline sulphates of soda, potash and magnesium are not now, though they used to be, considered curative and prophylactic; they may ward off albuminuria and other sequelæ.

Dram doses of infusion of digitalis every few hours should not be prescribed without careful attention; it will probably be seldom of much value; as an antipyretic it is not to be recommended; there are safer and more certain methods of reducing pyrexia; it is said to be still more valuable when uræmia sets in; poultices of digitalis leaves have been applied to the belly and back in uræmic convulsions; it may be useful in myocardial dilatation, which is apt to occur suddenly in scarlatina, as in diphtheria and Bright's disease.

*Emetics.*—Mustard and ipecacuanha, etc., have been used after the initial vomiting; it is asserted that a favourable influence is exerted on the further course of the malady.

*Desquamation* (see p. 481) is promoted by washing every day with coal tar soap and by giving a hot bath (100° F.).

*Constipation* rather than diarrhœa is the rule in scarlatina; castor oil or Gregory's powder is best, and may be disguised in warm milk, honey or gelatin capsules.

**Inunctions** are used to relieve cutaneous irritation, to reduce fever, to promote sleep, hasten desquamation and prevent contagion. The following may be used:—

Mutton fat, cold cream, carbolic oil 1 in 50, vaseline, cerate or geoline; glycerine may be mixed with these in varying proportions, and eucalyptus oil may be added as an antiseptic and scent; glycerine of borax as being antiseptic may be used instead of simple glycerine; I did not take kindly to universal inunction either for the early or desquamative stages; they must theoretically diminish the exhaling and excreting functions of the skin, and increase a liability to disease of the kidneys and other excreting organs by throwing on them an excess of work; nevertheless the practice sometimes proves very beneficial.

There is no objection to relieving the tension of the palms and soles by the infriction of geoline or vaseline, scented with a dram of eucalyptol to the ounce.

**Joints and serous membranes** may be inflamed during the course of and after the decline of the fever; rarely the joint swelling may precede the rash; these inflammations may be relapsing during the fever; they may be "rheumatic," but suppuration is not infrequent; cold wet compresses may be applied to the joints and to the sides in pleurisy for the relief of pain; if there be definite effusion the joints

should be wrapped up in cotton wool and firmly bandaged with flannel. Salicylates may be tried; they often fail unless there be much pain and pyrexia; an opiate may be given if there is restlessness and sleeplessness; Dover's powder is the best—three grains to a child three years old, repeated according to circumstances. Mere pyrexial albuminuria does not preclude the use of the opiate, though actual nephritis generally should; quinine in small doses is far more valuable than salicin or salicylates in my experience.

**Otorrhœa** is very common in and after scarlatina; the ears should be syringed twice or three times a day with warm water coloured with Condy's fluid; they should be carefully dried after each cleaning, and a small plug of antiseptic salicylic wool introduced just to guard the external meatus and absorb discharge; if the matter be highly offensive a little finely powdered iodoform blown into the external auditory canal is good. Powdered quinine, or salicylic acid, or boracic acid, glycerine of carbolic acid or of tannin, are useful stimulant and antiseptic applications. The syringing may be done with warm spirit lotion 3i. to $\bar{3}$x.; it is said to be more agreeable than warm water.

*Skin, dropsy,* and *kidney.*—For further prophylaxis and treatment, see p. 375. The risk of supervention of dropsy is certainly lessened by keeping the child in bed, thereby preventing chill and avoiding excessive work of the excretory organs; hot fomentations or spongiopiline may be placed across the loins in the beginning of renal complications; hot air baths (p. 376) and hot water baths (p. 481) are useful.

Sweating doses of nitrate of pilocarpin (gr. $\frac{1}{10}$ internally or hypodermically) may relieve uræmia or a hot and dry skin; children bear it well, but the heart and pulse should be narrowly watched; it seems likewise to soothe the nervous system.

The urine must be tested night and morning during the whole course of the fever; extensive dropsy may occur and disappear without albuminuria.

Some hold that quinine prevents the nephritis by its action on the protoplasm of Bowman's capsule, which is very problematical. Waring regards chlorates as very serviceable in dropsy following the fever. Dilute acetic acid given internally is said to prevent dropsy, but experience does not support this statement. Blisters have been applied to the legs in

scarlatinal dropsy and opened; they are not recommended owing to the cantharides and to the difficulty of getting the ulcers to heal; purgation with salines should be brisk. Juniper or gin is given by some for scarlatinal dropsy; it may be cautiously prescribed in half-dram doses of the spirits freely diluted, for a child of seven.

**Treatment during convalescence.**—Iron and gentian are excellent bitter tonics for the completion of convalescence by promoting appetite, digestion and blood making.

℞ Ferri Sulphat., gr. iii.
Glycerin., ℥xx.
Syr. Limonis, ℥xx.
Inf. Calumbæ, ʒii.

in water, three times a day before meals, is generally a palatable prescription.

Change of air and scene, with the most rigorous protection from cold and damp soil and winds, is of great benefit in the finishing up of the case after all signs of desquamation have disappeared. Bournemouth, Torquay, Penzance are usually mild and suitable climates when other places are too cold; sea air is not always suitable for albuminuria; dry inland resorts may be preferred in some cases; the erect posture, emotions, exercise and stimulants increase albuminuria; arsenic in two-minim doses, with dilute nitric acid ℥v., may be given, but not during the fever (Ringer); persistence of the strawberry tongue is a special indication for its use.

## ENTERIC FEVER.

There is no anatomical or physiological reason why children should not have typhoid fever in a severe form, and yet the disease is rarely fatal; boys between the ages of six and twelve are said to be the most frequent subjects of the fever; yet one cannot doubt its frequent occurrence in young babies; generally speaking the patients come of a healthy stock, and have a good previous history; the general consideration that growing organisms more successfully combat diseases of a

gradual course, and more readily recover from such gradually developing fevers, may partially explain the low rate of mortality of typhoid fever in children. The diagnosis of the disease naturally presents much difficulty at the outset and during the course of the disease; bear in mind bronchitis and gastro-enteric catarrh, which are often accompanied by typical remittent fever; pyæmia from ulcerative endocarditis and multiple periostitis; acute tuberculosis; tubercular meningitis; tubercular peritonitis; tubercular and simple ulceration of the bowels.

As the duration and degree of severity of typhoid fever vary vastly in different epidemics and in different individuals in the same epidemic, it is not surprising nor difficult to understand that gastro-enteric catarrhs or inflammations may be confounded with the milder attacks of enteric fever; pyrexia in infancy is prone to be markedly remittent; in typhoid fever of some degree the diagnosis seldom remains long in the balance; the dry heat of the skin, enlargement of the spleen, bronchial catarrh, typanites, rose spots which are usually less abundant in children, irregularity of the bowels, continued fever with morning remissions, are all present at the end of the first week of illness; the fever may be inverted in enterica.

Vomiting at the outset is a more frequent symptom in children; so is epistaxis; the cerebral symptoms may be very decided even a day or two after the beginning; these are delirium with a great tendency to stupor; the deep coma as of meningeal inflammation is very seldom witnessed in typhoid fever; the pyrexia of marked enteric fever is almost always higher and more regularly sustained than that of acute tuberculosis; constipation with a flat belly and with some head symptoms points most frequently to meningitis; if there is optic neuritis, or tubercle in the choroid, meningitis must be diagnosed. Constipation with a distended belly and muscular

tremors is not an unfrequent combination in typhoid fever; in a doubtful case a large spleen is no guide, for tubercle in the spleen may be attended with considerable enlargement of that organ. Persisting internal squint came on in an attack which turned out to be simple gastro-enteric catarrh in a girl aged four; this puzzled at first, but the subsidence of all symptoms, except the squint, and the detection of considerable hypermetropia explained matters.

Simple inflammations of the alimentary tract may, I feel certain, be attended with enlargement of the spleen; the clinical course of tubercular or simple ulceration of the bowel or of tubercular peritonitis, is far less definite and more straggling than that of a moderate degree of enteric fever, of which high and continued fever is a marked feature; the period of incubation of typhoid fever is rather long (two or three weeks); it comes in the same category as measles, hooping cough and chicken pox.

Cases of enteric fever are treated in the general wards of a hospital with but little risk of infection.

Abundance of fresh air, careful personal hygiene on the part of the doctor and nurse—washing the hands, keeping the clothes from coming in contact with the patients, especially when removing stools—disinfection of the stools, are important preventive measures.

If the child be ailing with fever he must be put to bed; he may get up part of the day, if the fever subside considerably, as it may do during the first days of typhoid.

Much of the typhoid of children is of the abortive kind; there is much less tendency to ulceration of the lymphoid plaques.

**Treatment.**—*Constipation.*—A teaspoonful of castor oil, or half a one for a small child, may be given occasionally during the first few days of the illness; afterwards it is best to relieve the bowel by a few ounces of warm soap and water.

*Diarrhœa* is not to be treated if only three stools a day, unless the stools are pea-soupy and very offensive, which usually means excess of mucus, and indicates a greater affection of the large bowel. A grain of Hyd. c. Cret. and one of Dover's powder often removes this offensiveness and improves the patient's condition. Profuse diarrhœa is best treated with Bism. Trisnit. gr. xv., Mucilag. Trag. ℥xxx., Chlorodyne ℥ii. every three hours; a thin starch enema, ʒss. with ten drops of laudanum, may be thrown into the rectum; these doses for a boy six years old.

The diet will require attention; milk should be withheld, or very weak condensed milk may be used instead (ʒi. to ℥vi.); chicken broth is often more suitable than beef or veal tea. The dose given should be very small; it should be cool also; if necessary, some gruel or milk may be predigested and most carefully strained of any solid parts; the object is to obtain absorption from the stomach and duodenum; not to give enough to increase the diarrhœa.

Logwood extract with chalk mixture often succeeds in cases in which bismuth and opium fail, and it is most successful as a rectal injection after each liquid stool.

*Antiseptics* are vaunted by some—borax, terebene, sulpho-carbolates, turpentine. Epistaxis at the outset of the disease rarely needs attention.

*Thirst* is sometimes troublesome; simple boiled filtered iced water in two teaspoonful doses at a time is better than much acidulated drink whilst febrile movement is going on.

*Antipyrexia* is effected by the usual measures (see p. 471); a tepid water bed, with or without a stream of water running through, can be managed without much trouble; tepid or cold sponging is easily carried out; any temperature above 103° may be treated; it does not follow because the growing organism recovers rapidly from the effects of pyrexia that it should be submitted to the action of high temperature any longer than is necessary.

Quinine gr. i.-v., antipyrin gr. v., salicin gr. v., have been given as in scarlet fever (see p. 472).

*Sleeplessness, restlessness, and excitement* are sometimes marked during the early stage, and should be combated by the employment of cold to the head; if the patient will permit it, an ice bag, or Thornton's cap; the head should be shaved in severe cases; a leech behind the ears might be useful if cold did not succeed; a few drops (3-5) of chlorodyne, or Dover's powder gr. v., for a boy of six, may relieve simple insomnia.

*Coma* rapidly setting in is due to a further degree of action of the same cause which gives rise to excitement, and ought to be treated by the same means.

*Continued shrieking* at the close of the fever, or after it, brings to the mind the possibility of *otitis*, but some convalescents from typhoid are often noisy and shout a great deal—probably from mental impairment.

*Mental obtuseness* and slow recovery of faculties often noted after typhoid fever call for no treatment beyond watching and waiting, unexciting amusement, fresh air especially from the sea and judicious nourishment with a little good wine or beer.

**Parotitis** is not very unfrequent; repeated hot fomentations under oil-silk, glycerine and belladonna to the skin, and good nourishment and stimulants are valuable; abscesses must be opened early.

**Subperiosteal** and other **abscesses** are seen at times towards the end of and after the fever in children; they require the ordinary antiseptic surgical treatment, as soon as discovered; they may cause but few symptoms.

**Gangrene of mouth** or **necrosis of hard palate** may occur; the sloughs separate slowly; the cases are by no means necessarily fatal; the parts should be kept sweet by syringing with chlorine water or weak Condy's fluid; frequent gargling is good, and will prevent undue contamination of the inspired air; iodoform should be blown from an insufflator on to the surface of the slough; iodol is not so good.

Sometimes **pleurisy**, **pneumonia**, and **bronchitis** develop, and require attention; hot fomentations or a light muslin-protected mustard-plaister may be put over the heart for five or ten minutes. Therapeutically, these inflammations require more stimulants; if cerebral symptoms coexist, the wet pack is invaluable; bronchitis appears occasionally to be increased as the result of a too free administration of nourishment and stimulants.

**Perforation of intestine and peritonitis** may occur in children, and often proves fatal; perfect rest, with protection of the abdomen; sufficient doses of the pure powdered opium, commencing with gr. $\frac{1}{4}$; hot fomentations to the belly and frequent small doses of cold drinks of whey, barley water, broths and stimulants in proportion to the demands of the pulse and heart and nervous system, constitute the treatment; hæmorrhage from the bowels is rare; the great principle is to keep the patient and his bowels quiet, and opium usually effects both purposes.

Gallic acid gr. v. in syrup ℥xx. Aq. ʒii. is not of much value. Ice-bags and iced water injections may be tried, but not for longer than an hour at the time; the sudden application of cold may do good, the prolonged application never. Perchloride or pernitrate of iron in ten-minim doses, acetate of lead in two-grain doses with opiates, turpentine in ten-minim doses have been tried. Ergotine in two-grain doses may be injected under the skin, or half a dram of the liquid extract may be given with mucilage and syrup by the mouth.

**Excessive tympanites** is of grave import; it impedes cardiac action, and must be treated by stimulants. Half-an-ounce of gum and ʒss. of turpentine may be injected into the rectum; terebene is even better; assafœtida may be used. These are also given internally in five-minim doses, with mucilage, syrup, honey, or glycerine, and some aromatic water. A dry tongue with nervous prostration and muscular tremors is not better treated by turpentine than by good brandy and careful feeding.

**Laryngeal ulceration** is not common in children; it varies in different epidemics. **Diphtheritic membrane** may form in the larynx. For treatment see separate sections.

But the treatment of these symptoms and complications is of trifling importance compared with the necessity for the **treatment of the patient.** Absolute rest for the mind and body, so as not to waste the energy, on the one hand, and careful diet and stimulation, so as to restore and eke out the energy to the best possible advantage,

on the other, are the commandments for the treatment of typhoid fever. Undiluted milk ought never to be given to children suffering from enteric fever; it is of imperative importance to secure fine division of the curd; I prefer the use of condensed milk in typhoid fever, though some fresh food must be given. Whey, made in the ordinary fashion, or by boiling milk with a little lemon juice may prove of great value when the stools contain much curd, and the child has "stomach-ache," in or after the fever. Barley water and milk in equal parts and Mellin's food with water and thin milk are good. Vegetable broth made from a hodge-podge of barley, carrots, potatoes, peas, etc., and carefully strained, is a great change after the veal and mutton broths, beef tea and chicken tea. Indeed, if the diarrhœa be copious, it should be preferred to them; it is absurd to suppose that animal broths always promote diarrhœa. The food must be given "little and often." When the patient is really ill, write out in cut-and-dried fashion the quantity of broth, beef-tea, etc., and stimulants to be given, and mark the hour at which each is to be administered. [Brieger finds that cultivation of the typhoid bacillus in beef-tea produces a powerfully poisonous alkaloid; Brunton thereupon suggests the avoidance of beef-tea and such (?) albuminous diet.] This chart may require alterations, but the "cut-and-dried" statement is, nevertheless, the correct thing. The indications for stimulants and the signs that they are doing good are not different in typhoid fever from those in any other febrile illness. The dry glazed tongue, small, dicrotus or thready pulse, feeble first sound of heart (it is interesting to watch the first sound of the heart become gradually altered during the course of the fever) or much sweating, require brandy or wine; the pulse may be infrequent in typhoid when the temperature is high.

In returning to ordinary diet, it is highly necessary to pro-

ceed cautiously; any solid food may bring back the fever and increase the ulceration, which should be healing. Many cases of "after fever" are due to this feeding too quickly; others are doubtless due to relapses; the constipation, often troublesome after typhoid fever, should be treated by enemata with a little castor oil or olive oil; purgatives given internally should rather be avoided for some time; liq. Ext. Cascara Sagrada is useful after a few weeks have elapsed, ɱxv. t.d.s. for a child of five; pastiles are not disagreeable to take (Martindale); Duncan and Flockhart have introduced capsules of the same; iron and strychnia are useful adjuncts. The low temperature of the body frequently seen after typhoid is probably an indication that ascending metabolism is greater than descending; it is not a bad sign in itself, and merely requires careful clothing and feeding; this lowness of temperature is seen after many fevers, but more after enteric, in my experience.

The value of abundance of fresh cold air in typhoid fever seems to be strengthened by the recent successful treatment of the fever by inhalations of artificially cooled air.

The *typhoid state* is usually treated by careful feeding and stimulation. Caffeine in one-grain doses, or digitalis in three-minim doses, may remove cardiac dilatation and promote diuresis; the doses for a child of seven. It has been proposed to employ benzoic acid and salicylic acid in the treatment of typhoid conditions; these substances, and such as toluene, zylene, toluic acid, ethyl and propyl benzine, which are transformed into benzoic acid in the organism, are supposed to dissolve and carry out of the system the imperfectly oxidized bodies resulting from the disintegration of tissues and foods; the dose should be three grains three times a day for a child five years old, and may be increased according to circumstances. Benzoic acid, as less liable to weaken the heart, is preferable; benzoate of soda is considered preferable by some (gr. iii.), and is somewhat antipyretic also.

## MUMPS.

A simple case of mumps presents no difficulty in diagnosis and requires but little treatment; the patient should be

isolated two or three weeks; the period of incubation varies between two and three weeks, and may be even longer. Social intercourse should not be allowed until two weeks after the first appearance of the glandular swelling.

The bowels always require a simple purge; mumps is rarely seen before four years of age; the fever is apt to be severe, and may require tepid sponging or wet packing. Occasionally severe but transient constitutional disturbance and high fever herald the approach of metastatic inflammation in the testicle or mamma; this is not so frequent as in adults; sometimes the constitutional symptoms come, but not the orchitis; delirium or convulsions may open the case.

Mumps may counterfeit scarlatina and diphtheria at the outset; the constitutional effects are, with the exceptions mentioned, less serious; it is said that mumps may spring its local fury on the lymphatic glands instead of on the true epithelial glands.

The patient should be kept in bed during the fever, which lasts about a week, and be confined to one room for a week afterwards. Deglutition, mastication and articulation should be avoided as much as possible; a liquid or soft diet is required—broths and jellies. As a rule the salivary secretion requires no consideration; it is occasionally profuse, but not then offensive, unless the bowels are loaded, and the tongue furred, when a simple purge is indicated; the tongue may be dry and brown simply as the result of breathing over it as in old people; a dry brown tongue thus originated does not indicate a typhoid state.

The parotid or submaxillary swellings should be fomented with boracic lint or clean flannels under oil silk, but the skin should be painted first with glycerine of belladonna; the fomentations should be repeatedly renewed; this treatment gives great relief to the aching sensation. The third of a

grain of grey powder given three or four times a day is said by Ringer to relieve pain and swelling; but the pain has a tendency to abate of itself.

The testicle in boys (orchitis) may require the same fomentations; any complaint of the part should be followed by local applications, a saline purge and rest in bed. Aconite is used by some; some prefer warm wet compresses of lint or hot spongiopiline; instead of the belladonna paint, chloroform, turpentine or tincture of belladonna and opium have been used; if local measures relieve not the pain, an opiate may be given internally; Dover's powder 5 grains, or chlorodyne 5 minims, for a child five years old.

*Fever* may be treated by the usual bath and sponge methods and by drinking plenty of bland fluids: bitartrate imperial ʒi. to Oi. of cinnamon water, or half-a-dram each of nitrate and bitartrate of potash in thin barley water flavoured with lemon, to promote diaphoresis, diuresis and peristalsis.

Tincture of aconite in half-drop doses frequently repeated, has been used in drop doses; it is valuable when the fever is high and the skin and mouth dry.

*Convulsions and delirium* ought to be treated by a hot mustard bath, with cold water poured over the head, and by free purgation with compound jalap powder ʒi., or elaterin gr. $\frac{1}{20}$, for a boy six years old.

*Specifics* to cut short the disease.—Jaborandi infusion, or nitrate of pilocarpin under the skin, are said to arrest mumps; they must be given at the onset; twenty-drop doses of the infusion, or $\frac{1}{16}$ grain of the hypodermic preparation, is the dose for a boy of five; the effects require watching; children stand these drugs well as a rule; occasionally cardiac depression is said to come on.

*Deafness* may be cured by Politzer's bag, air being forcibly blown into the nostril whilst the child swallows, or even without its swallowing; the mouth and other nostril should

be shut; if the child is old enough he may be taught to do a Valsalva experiment to inflate the tympanum.

Occasionally permanent deafness occurs, and may be treated by iodide of potassium, though seldom successfully; it may be due to disease of the auditory nerve or of the internal ear. Positive brain lesions may occur in mumps and be ushered in by convulsions and delirium, which symptoms may, as we have seen, occur independently of actual organic cerebral change; the lesion is usually vascular, but may be merely functional; hemiplegia or epilepsy may be the clinical manifestation.

## DIPHTHERIA.

Diphtheria is a powerful destroyer of nervous energy; asthenia is *the* danger in it, and certainly not less important than the spread of the disease to the larynx—an event which usually happens within a week of the appearance of the throat disease. The most malignant form of diphtheria, though a toxæmia, has no relation whatever to septicæmia; in this form the little patient rapidly becomes profoundly prostrated, with a low temperature and feeble, perhaps very slow, action of the heart, as manifested in the blueness and coldness, and other signs of collapse and nervous depression; in such a case the patient may die, without the faintest attempt at rallying.

When this asthenic state results from septicæmia, it usually occurs later in the course of the disease, and is attended with symptoms indicative of the typhoid state; it is frequently febrile, and is less rapidly fatal than the most malignant variety; there are all shades of these two serious varieties from the fatal end of the scale to the other, in which the symptoms are comparatively slight.

The incubation of diphtheria is effected in four to six days; remember that the disease is one of those with a short period of incubation, like scarlet fever and typhus.

The *diagnosis* has to be made chiefly from tonsillitis and scarlet fever; the fever of scarlet fever and tonsillitis is usually of rapid onset, and reaches its height (103-104 frequently) in a few hours; the rise of fever in diphtheria is slower altogether, there is rather a tendency to a low febrile temperature, and yet to a far greater sense of illness than attends tonsillitis q.v.; the spots of follicular stuff in quinsy seldom form a continuous lamina, and there is no tendency to spread beyond the tonsillar region. The glands at the angles of the jaw do not become *hard* and large as in diphtheria, and albuminuria is generally absent. Hoarseness, or any alteration of the cry or voice, points to the involvement of the larynx, and mostly by a membranous exudation.

The *nasal*, or rather nasopharyngeal, form of diphtheria is frequently fatal in children, without there being any membrane visible by direct inspection from the mouth. Severe illness, vomiting and an ichorous discharge from the nose and sometimes otorrhœa, are the chief signs of this variety. The membrane may be seen by inspecting the anterior nares; posterior rhinoscopy is not very practicable in young children, owing to the smallness of the parts and to the inability of children to give assistance. The forefinger might be passed behind the soft palate, and valuable indications might thus be afforded.

The causation of the **paralysis** and other **nervous sequelæ** of diphtheria has never been explained; sufficient attention has not been given to the nervous depression, which is a feature of the attack of diphtheria itself; I am perfectly certain that many deaths in diphtheria, and especially those in which vomiting and irregular, slow pulse are features of the clinical course, are literally cases of diphtheritic palsy occurring *in* the disease. The explanation of the interval, or period of incubation, which elapses before the development of the paralysis is very difficult; whether there is a second

"brewing" of the poison, whether the ascending neuritis is creeping up to the cord, or whether the nervous system after diphtheria is merely predisposed to the paralysis and some exciting cause, as over-exertion, bad feeding, wet and cold are necessary for its development is unknown; the interval is not a fixed period; it varies in different cases, not without some reason. Sir W. Jenner has said that the symptoms of fatal cases of diphtheritic paralysis always begin before a few weeks have passed by; my own investigations support this. Bernhardt's statement that half of the cases of diphtheria lose the knee-jerk whether they have paralysis or not is perfectly true.

I have watched the mode of disappearance of the knee-jerk in several children convalescent from diphtheria; its final extinction is frequently preceded by an exaggeration of the phenomenon; in one case a tap on the one side not only caused the triceps of that side to contract well, but there was also an apparently simultaneous contraction of the other triceps extensor; a day later the knee-jerks could not be obtained on either side. It seems, then, as though the extinction of the knee-jerk, like the final spontaneous extinction of the wick of a candle, is attended with a flickering or irritable manifestation of weakness; the "lightening" which often occurs just before death comes to one's mind in this connection; see the arguments also in my papers on chorea.

Paralysis of the soft palate allowing of regurgitation of fluid through the nose and causing a nasal voice; paralysis of the ocular muscles of accommodation causing an inability to thread a needle; paralysis of the external rectus causing convergent squint, and weakness of the masseters and internal pterygoids, allowing the mouth to be wide open, are the most common motor phenomena (including loss of knee-jerk) of diphtheritic palsy; weakness of the legs and arms, trunk and neck muscles is frequent; sometimes there is more inco-

ordination of movement than weakness. The sensory phenomena are marked; there are spontaneous sensations of numbness and tingling generally in the paralyzed parts, and anæsthesia; the sensory nerves of muscles appear to be disordered in function in various degrees: as manifested in the sensations of weight and heaviness, or, at times, of lightness ("limb feels as light as a feather"), as well as in the ataxia of gait, which cannot always be ascribed to muscular weakness or motor inco-ordination. The vacant stare of these paralytics is partly due to the open mouth, and partly to a vaso-motor spasm and atony of the facial muscles; there may be sensory disorders of vision (for acuity, field and colour), and of hearing; taste and olfactory perversions are less noted.

When I say that in six years I made post-mortem examinations on twelve cases of death from diphtheritic palsy, the reader of this book will not be led away by the usual statement that diphtheritic palsy usually terminates in recovery. As to the percentage of recoveries in children, we have no information, but of its frequent fatality the practitioner should be aware. Slight cases, in which the ocular and palatal paralysis and anæsthesia are the only symptoms, may be very frequent; the general physician is seldom consulted for such symptoms alone. In some cases a diminution in reaction to faradism clearly shows that the lower motor segment is affected (nerve or cord); it may be a slow subacute myelitis or neuritis; I would suggest that slight changes in nerve or cord sufficient to cause weakness need not lessen the faradic or alter the galvanic reactions of the weak muscles.

**Preventive treatment.**—The case should be isolated, as being of a contagious nature. The sanitary conditions of the dwelling and its neighbourhood should be investigated; the air, water, milk and other hygienic surroundings should be carefully examined for the cause; emanations from

manure heaps, and dust from the demolition of old houses, are given as causes, and should certainly be avoided. The actual **treatment** of diphtheria consists in three things at least: (1) Combating the acute neurasthenia. (2) Most sedulous attention to the local seat of disease. (3) Feeding, which is included under the first, but requires a special mention.

The throat, nose, larynx, bronchi, wounds, and rarely the œsophagus, may be local seats of the disease. Whether these local seats are entrances or exits of the diphtheritic poison is not known; but be thoroughly convinced of the necessity for topical applications carried out as rigorously as possible. For an exposition of the importance of local treatment based on the germ theory, and for an advocacy of early tracheotomy as a means of preventing the spread of membrane to the trachea, read a paper by Watson Cheyne in the "British Medical Journal," p. 904, 1887.

Let me take the first and third things together. The administration of nourishment should be carried out on the "little and often" principle; beef tea and meat essences are most useful, but chiefly as stimulants; indeed, in severe cases but little food can be digested, and the battle is to eke out the victim's vitality by carefully conducted, even sedulous stimulation. In these cases the food may be predigested; brandy, champagne, port wine, jelly and all the resources should be called into requisition. Vomiting may be managed in the manner mentioned on p. 322. Feeding by rectal enemata or peptone suppositories (Savory and Moore) should be supplemented by the use of the nasal catheter; it is a great mistake to suppose that this method of alimentation is difficult; the child must be put to bed in a tent, which should be ventilated by a hole at the top. The bronchitis kettle or steam spray, with 1 in 20 carbolic acid, should be arranged so that the tental atmosphere is kept moist and

warm, and as far as possible aseptic ; the child must not be distressed any more than must be, for the strength is to be strictly husbanded; sleep should be secured by absence of noise, and by bromides, gr. v., or chloral gr. iii., guarded with stimulants of liq. ammonia ℥x. or brandy ℥x.

Cold wet compresses are used to the skin of the throat, and frequently changed so as to soften and diminish the glandular swelling; hot boracic acid fomentations under oil silk are preferred by some. Bronchitis, broncho-pneumonia and pneumonia should be treated by free stimulation, hot fomentations, linseed poultices, and an occasional mustard plaister carefully guarded ; these complications may arise apart from tracheotomy. Hæmorrhages from the nose, with the urine, from the bowels and into the skin (purpura) call loudly for stimulation, but the danger is not even then usually averted. Of the indications for tracheotomy see p. 158. The management of cases of tracheotomy is conducted on the general principles of removing all obstruction to the breathing, of keeping the wound and secretions sweet, of not meddling with the trachea more than is necessary, of removing the tube as often, and as soon, and for as long a time as possible—regarding it, in fact, as a necessary *bête noire*—and, finally, of supporting the patient. For the details of surgical management I cannot do better than recommend the 2nd Edition of Mr. R. W. Parker's work on "Tracheotomy."

Iron and quinine is the best medicine for combating the neurasthenia and anæmia.

℞ Tinct. Ferri Perchlor., ℥v.
Quinæ Sulph., gr. i.
Glycerini, ℥xx.
Aquæ, ʒii.

for a child of five ; some prescribe much larger doses of iron alone. This is what I have found most useful.

The treatment of diphtheritic **paralysis** must be carried out on definite notions concerning its danger. Any degree of it which attracts attention should be treated by rest in bed at least for a week or so in a room kept at a temperature of 65°, with the cot away from draughts; these regulations are most necessary if the palsy has come on within two weeks of the local diphtheritic lesion. The danger threatens from three quarters at least: (1) paralysis of larynx; (2) of the diaphragm and other respiratory muscles; (3) of the heart. Sudden death *in* diphtheria is ascribed to this paralysis, to simple vagal inhibition, to "myocarditis," and to the formation of clots within the dilated ventricles.

An ineffectual cough is an important sign of laryngeal palsy; the belly sinks in during inspiration when the diaphragm is paralyzed; it is the chief respiratory muscle in young children; paralysis of the muscles of deglutition should be treated by feeding the patient with the nasal catheter passed into the stomach from the nose; the rectum may be employed as a place of feeding, though it is more intolerant of interference in children than adults.

Albuminuria is not often of high degree in diphtheria, but sometimes the patient dies of uræmia, and rather suddenly, too, in the course of the disease; in such cases I have found a very large white kidney, the capsule being distended; there has not been much interstitial change; in two cases of the kind the urine was so albuminous as to almost solidify the whole portion boiled; the sudden death is largely attributable to a cardiac palsy which digitalis and brandy are often powerless to avert. Chronic renal disease sometimes starts from a diphtheria, but some of the cases quoted of this kind may have been scarlatinal membranous sore throats. (For treatment of Uræmia see p. 376).

When the child is completely convalescent from the diphtheria, or its nervous sequelæ, or if the latter be slight, a

change to the country with frequent exposure to fresh air during the day is beneficial; cold, damp, and fatigue should be regarded as envious enemies which may educe a palsy which might otherwise have been tided over; cod-liver oil and steel wine may be given alone or in combination (see directions on p. 68).

Massage and galvanism (see Infantile Palsy) are of some service in promoting the return of power to the muscles. Electricity may also be tried in cases of diphtheritic palsy of the diaphragm and heart, the positive pole being placed at the nape of the neck and the negative stroked about the epigastrium and along the course of the vagi; the faradic shock may be tried in cases of cardiac syncope.

The *drug treatment* of diphtheritic paralysis counts for something; belladonna tincture, ℥x. or more t.d.s., freely pushed is the most useful; its effects should be carefully watched; liq. arsenic ℥ii., quinine gr. i., liq. strychniæ ℥ii. t.d.s., are useful doses for a child of five; the belladonna has apparently assisted largely in the cure of desperate cases. Last, but not least, **topical** applications to the diphtheritic lesion; their number is legion; every practitioner has his own agencies.

(1) Spray of sanitas frequently used. (2) Gargle of chlorate of potash or chlorine water, also frequently used if the child be old enough. (3) Iodoform in fine powder blown on to the diseased surface.

The principles are the greatest possible cleanliness by the removal of all mucus and septic materials; the removal of membrane if it can be easily detached; antisepsis by iodoform. Mopping the throat assiduously with a sponge fixed on a holder is good if the child cannot clear out its own throat. Discharges ought to be removed as soon as possible to prevent absorption of septic matter by the circulation, lymphatics and air passages. I do not use escharotics, nor

tear away firm membranes, nor antærics, nor special solvents of the membrane; doubts have been thrown of late on the *antiseptic* property of iodoform.

The vast mass of methods of treatment may be arranged under the heads indicated below; they may be used to the nose as well as to other parts.

I.—Severe, not to say violent local measures: Escharotics, sharp spooning, galvano-cautery. The galvano-cautery has been applied to the patch with the object of causing it to slough away. Dr. Bloebaum, of Coblenz, has used a special apparatus, which may be inspected at Messrs. Buehl, 75, Coleman Street, E.C. Dr. Nix, of Rude, employs the sharp spoon, scraping away all the membrane, even the subjacent softened and infiltrated parts, and then cauterizing the bare surface freely with solid nitrate of silver.

*Escharotics* to destroy the deposit, including the germs and so to stay the spread of the deposit. Solid nitrate of silver stick, or strong solution gr. xx. to 3i. of distilled water; equal parts of hydrochloric acid and honey; nitric acid and honey equal parts; these are applied with a camel's-hair brush or with a mop of small sponge mounted on whalebone or held in a sponge holder; one application at the outset is the usual recommendation.

II.—Astringents used with the same object as escharotics, but they are less radical; some recommend these not to be repeated: Equal parts of glycerine and liq. ferri perchl. fortior. put on the patch of membrane with a camel's-hair brush in the early stage of the case; glycerine of tannin and of carbolic acid; nitrate of silver gr. x. to ʒi.—brush or spray; tincture of iodine to the ulceration; powder of salicylic acid applied by insufflator or finger; this may be combined with moppings of four-per-cent. solution of cocaine.

III.—Antærics, usually varnishes, to keep away the air and oxygen, as in ringworm, to prevent the growth of the organism on which the diphtheria is supposed to depend. Morell Mackenzie advises a solution of solid tolu balsam in ether; the part should be dried with blotting paper, and the tolu painted on the patch of membrane and on a margin around each patch; other remedies are used also; it is hoped by this means to prevent the spread to the larynx; traumaticine (gutta percha dissolved in chloroform 1 to 10) has been advocated also.

IV.—Solvents to dissolve the membrane off; this is certainly un-

objectionable treatment; they are mostly applied by means of hand or steam (Seigle's) sprays; gargles and brushes may be employed. Lactic acid sp. gr. 1·312 (Martindale's), may be applied with the brush undiluted; or 3i. to ℥ii. of water may be sprayed on to the membrane; spray of lime water, spray of five-per-cent. solution of tannin. Solutions of vegetable ferment papayotin (from papaw juice) painted on with a brush at frequent intervals; it is a solvent by fermentation, but is costly and ineffectual. Inhalation by atomiser of trypsin; to be used frequently; the liquor pancreaticus (Benger) is usually handy; a dram to the ℥i. may be sprayed from a Seigle (Lewis Smith speaks highly of it); Fairchild's trypsin may be used.

V.—Antiseptics and germicides to prevent putrefraction, promote cleanliness and the removal of membrane are certainly valuable; gargles, sprays, insufflations, or direct applications by the finger or sponge or mop; warm in preference to cold gargles are to be recommended as likely to be more active.

Gargles of solution of chlorine (P.B.) and solution of chlorinated soda (B.P.)

„ of quinine 3i. to ℥i., or stronger; it may be sprayed.

„ of Condy's fluid 1 part in 10.

„ of tincture of capsicum, 3i. to ℥x.

„ of liquor sulphurosi acidi, diluted 1 in 5 or 10.

„ of corrosive sublimate 1 in 1000 or 1 in 500 with glycerine or it may be sprayed.

Inhalations of iodine (vapour cone of North Hants Chemical Company).

„ of solution of sulphurous acid, also spray.

„ of alkalis (sodic carbonate), persistently used to prevent spread to larynx, used when the least huskiness is observed (Lewis Smith). Trypsin as much as can be suspended in the following:—

℞ Sod. Bicarb., 3ii.
Aq. Calcis, ℥vi.

Swabbing with "boroglyceride" (Barff's).

„ with helenin (Obiol), which dissolves in the proportion of two per cent. in oil of almonds; the patch is first powdered (finger) with camphor, then the oil painted on; every four hours.

VI.—**Internal remedies.**—*Emetics* valuable sometimes at the

outset; mustard is the best; it diminishes spasm of larynx and empties the trachea of much of its contents; ipecac. wine 3i. repeated every ten minutes till effective is depressing but efficacious in simple spasm; sulphate of zinc (3ss.) or sulphate of copper gr. i. *repeated every few minutes* till effective (child six years old).

*To detach membrane by promoting secretion in the pharynx.*—Infusion of jaborandi 3ss. t.d.s., or $\frac{1}{30}$ grain of pilocarpine hypodermically for a child two years old; Tinct. Acteæ Racem. ℥v., in Spt. Am. Arom. ℥v., Glyc. ℥xx., Aq. 3ii. for a child two years old.

*Antiseptics.*—Tincture of iodine one or two minims in syrup of orange or quince; helenin one grain t.d.s. for a child six years old after the local application; this drug is constipating.

Corrosive sublimate gr. $\frac{1}{100}$ with or without perchloride of iron and glycerine; its continuance is to be gauged by the condition of the false membrane; more to be given if the membrane spread, and *vice versâ;* great care should be exercised in using this valuable antiseptic.

*Alteratives (?).*—Prophylactic and specific. 1. Chloride of gold gr. $\frac{1}{30}$ every hour; for a child two years old; requires watching; is on its trial.

2. Bicarbonate of potash gr. iii. every four hours; for a child two years old; the skin to be first thoroughly cleaned by a hot bath in which plenty of bicarbonate of soda is dissolved; is of doubtful efficacy.

3. Benzoate of soda in two-grain doses, and gr. $\frac{1}{10}$ (separately) of sulphide of calcium in pillule or syrup; also inhalations by atomiser of ten-per-cent. solution of benzoate of soda; free stimulation and feeding; reduction of fever by quinine, aconitine, or antipyrin; probably of no special value. (O. Brondel's method.)

4. ℞ Liq. Ferri Dialysat., 3ss.
Glyc. Acid. Carbolici, 3ss. (P.B.)
Glycerini pur., 3iss.
Syrupi, 3iss.
Aquam ad ℥ii. 3i.

every two hours for eight days at least (John Irving).

*Antiphlogistics:* Depressants of heart, circulation, and nervous system with a view *to relieve spasm and promote detachment of membrane and to cut short the disease.*—*Antimony* wine five minims every hour; good in simple laryngitis and at the outset perhaps of diphtheria, but exhausting and prostrating; it should not interfere with the call for tracheotomy. *Calomel* gr. $\frac{1}{2}$ every hour and mercury ointment rubbed into abdomen; recommended in "sthenic" forms; venæsection (four ounces) from arm

or jugular vein; none of these measures can be recommended; sthenic forms are of questionable existence.

## HOOPING COUGH.

Hooping cough is a contagious and infectious chronic specific fever, attended with severe nervous disturbance and mental distress, paroxysms of coughing and laryngeal spasm, frequent bronchitis, vomiting after the cough and epistaxis. Ulcers under the tongue, about the frænum, are common, but I have never seen this ulceration in hooping cough unless the child had teeth in the lower jaw (see Syphilis). Sometimes hæmorrhages take place from any mucous surface; extravasation of blood under the conjunctiva is of frequent occurrence; occasionally blood is extravasated into the brain; hemiplegia and monoplegia are known to occur in association with hooping cough; these have been attributed to thrombosis of veins; a hæmorrhage would explain them equally well, and in fact better, if the child becomes paralysed without being severely ill from the disease; hæmorrhage from the external auditory meatus is said always to point to rupture of the tympanic membrane. There is a great discharge of glairy mucus from the trachea; it is not unfrequently ejected from the pharynx, doubtless not from the act of hawking, but rather more mechanically; or vomiting may cause its expectoration. Dr. Eustace Smith believes that there is also an excessive secretion of mucus from the stomach and intestines—"mucous disease." Children with hooping cough do vomit and pass mucus from the bowel, and are ill with it; doubtless there is a sympathy between all the mucous membranes of the body, so that one is not diseased without the others suffering; and that is more evident in children than adults.

Laryngismus stridulus is mistaken for hooping cough, but the hoop of the latter complaint only succeeds to a fit of coughing, whereas it is the initial disturbance in laryngismus; the two diseases are said to complicate one another occa-

sionally; this is a little unnecessary; laryngismus is very liable to occur whenever there is any abnormality of the child's larynx; even in the very early stage the catarrh of pertussis is more severe, and attended with a more spasmodic cough than that of simple catarrh; the bronchial and pulmonary complications are very important — bronchitis, broncho-pneumonia, collapse, vesicular and subcutaneous emphysema; pleurisy is frequently present after death, but rarely without bronchitis and pneumonia in my experience; phthisis and acute tuberculosis are frequent sequelæ in the scrofulous, and indeed when there is no indication of this diathesis; rickets makes the prognosis of hooping cough bad, owing to the impaired powers of respiration and to the general debility associated with it.

Tubercular meningitis is occasionally developed at the close of hooping cough; herniæ frequently first come down; the various thoracic deformities may often be traced to hooping cough, especially the true pigeon breast; the true rickety thorax is often modified by this complaint.

The organism after hooping cough is left in a peculiar state for some time (as in ague, but to a less degree); a mere catarrh often has the characters of hooping cough imparted to it, even months after the subsidence of the complaint; these can hardly be explained as relapses.

Hooping cough is one of those fevers with a short incubation period, like scarlet fever, diphtheria, etc.; the infection lasts about six weeks, and the complaint itself about two months; these are average statements.

The **treatment** of hooping cough will almost necessarily be of the *expectant* kind; everything should be tried. A healthy child usually requires but little treatment; the fresh air in autumn, or when the weather is not too cold nor wet, is better than close confinement, provided there be no noteworthy loss of strength and no pulmonary complications. A little sibilant rhonchus need not keep the child indoors except

in bad weather; in the spring and autumn, when the disease is most rife, the *clothing* of the child is important; the body must be warmly clad with woollen or flannel raiment all over its surface; the belly binder should be applied if there is diarrhœa.

*Severe cases.*—If the child is really ill with the complaint he must be kept in one room or in bed, with the room warmed to 65° F., as in the treatment of fevers. Bronchitis and pulmonary complications (q. v.) require supporting treatment; a simple mustard emetic is of much value in clearing the tubes. The diarrhœa with slimy ejecta is best treated with small doses (half-a-teaspoonful) of castor oil; fruit, sugars and farinaceous articles as leading to the generation of acid products should be avoided for a few days, and afterwards limited in quantity.

*Liniments* of turpentine and acetic acid may be rubbed into the chest and throat when the coughing is troublesome and bronchitis is present; warm linseed tea or barley water with a little liquorice is good for *promoting perspiration*, and tends to relieve the spasm and diminish the frequency of the attacks of coughing. Doubtless the paroxysms are more frequent and severe when the blood is not thoroughly depurated by the kidneys, and warm drinks appear to promote the excretion of impurities from the blood; from this standpoint the action of the bowels should be regulated. For the bronchitis or simple cartarrh order ipecacuanha with or without ammonic carbonate; the ammonic acetate is preferable when the cough is hard and not loose.

℞ V. Ipecac., ♏iii.
Am. Carb., gr. ii.
Glyc., ♏x.
Aq., ʒii.

for a child two years old, three or four times a day.

To diminish the number and severity of the attacks use

the bronchitis kettle three or four times a day; a teacupful of 1 in 20 carbolic acid and four teacupfuls or less of water (if more carbolic is wanted) placed in the kettle and boiled; the children sit near the spout and breathe the steam; this is very useful in my experience; it probably acts as an anæsthetic to the larynx, nose, and throat; is probably beneficial also to the mucous membrane itself. Dr. Sansom regards this as perfectly useless, but recommends Calvert's domestic carbolic vaporiser, or Savory and Moore's vaporiser; the liniment, ipecacuanha, and carbolic spray form my general treatment, and in the majority of cases nothing further is required during the catarrhal stage of the disease; at its decline prescribe

℞ Ext. Cinch. Liq., ♏iii.
Glycerine, ♏x.
Syr. Aurantii, ♏x.
Decoc. Cinch. ad ʒii.

for a child two years old.

If the hooping or paroxysmal stage is prolonged and obstinate, prescribe belladonna and hydrocyanic acid and bromide of potassium—with a view to relieve the *nervous distress* and diminish the severity and frequency of the paroxysms; use them separately, not together, each for a few days.

℞ Tinct. Bellad., ♏x.
Aq., ʒi. t.d.s.

℞ Acid. Hydrocy. dil., ♏½ or ♏i.
Glyc., ♏x.
Aq., ʒii. t.d.s.

℞ Am. Brom., gr. iii.
Syr. Aurantii, ♏x.
Spt. Am. Arom., ♏iii.
Aq. Chlorof., ʒii. t.d.s.

Each for a child two years old.

I have seen at least a hundred frænal ulcers in hooping cough; not one required special treatment.

The *paroxysm* of hooping cough should be regarded as a genuine, limited, local reflex bulbar epilepsy, attended with violent cortical discharges, which may occasionally lead to total unconsciousness, but always entail a certain amount of mental distress, fright, or terror, and coincident loss of intelligence.

Sometimes the *vomiting* which follows the hooping paroxysm proves serious from the starvation and sequent wasting, which should be met by giving the food every hour, if necessary, in small doses of ʒi. or ʒii., iced or cold; and giving it immediately after the cough. The *food* should be very nutritious: animal soups or vegetable soups, thickened with Mellin's food; milk and barley watey; raw meat juice, sweetened and iced; small doses of wine or brandy, or champagne; and if it can be taken, pounded chicken or meat; a peptone suppository put into the rectum every four hours is good in severe cases.

The tendency to vomit is sometimes checked by minute doses of ipecacuanha wine frequently given, or by large doses of bromide; and frequent grain doses of oxalate of cerium have been commended.

It is seldom necessary to go outside the circle of remedies above mentioned; at the decline of the case there is nothing that equals a change of air to the country (dry inland or sea-side); a little iron and quinine, with good diet; attention being paid to the stools in judging of the food; and protection of the surface of the feet, neck, chest, belly, as well as of the limbs, to prevent catarrh; friction along the spine and general massage are valuable.

I shall now give under appropriate headings various remedies that have been used in hooping cough:—

I.—Drugs which soothe and depress the *reflex nervous apparatus;* this is their chief action.

*Opium* wine or tincture in drop doses during the paroxysmal period; the effects carefully watched; useful in some cases.

Narceine has been prescribed with syrup and water in centigramme doses, repeated as may be necessary; it acts like morphia. Inhalations of *chloroform* and *ether* to lessen each paroxysm.

Tincture of *lobelia*, ten minims, every hour to a child two years old (Ringer). *Zinci valerianatis* gr. i. every four hours (watching effects), child two years old. *Alkalies*—Carbonate of potash gr. ii., syrup ℥xv., Aq. ʒi.; four times a day for a child two years old.

A wine glassful of infusion of *clover*, made of two ounces of carefully-dried red blossoms, steeped in a pint of boiling water for four hours; for a child two years old. *Succus conii* in ʒss. doses, three or four times a day; for a child two years old; sometimes useful when sleep is much disturbed. Five minims of *liq. ext. of ergot*, t.d.s.; for a child two years old; I believe to be valueless; also Tinct. *Sumbul* ℥x., t.d.s.

*Mixtures of Antispasmodics* —

Tinct. Belladonnæ, ℥iii.
Tinct. Valerian., ℥i.
Tinct. Digitalis, ℥i.

two or three times a day, for a child one year old; gradually increased, and its effects watched.

*Chloride of gold* and sodium gr. $\frac{1}{48}$, given every two hours; an effect said to be produced in a few hours.

*Croton chloral* one grain every four hours—child one year old—alone or combined with belladonna ℥v. or tinct. of cardamoms ℥v.; two grains for a child ten years old.

*Quinine* in large doses, gr. ii. or iii., t.d.s., for a child two years old. *Benzol* ℥v. in syrup ʒss. and water ʒi., t.d.s.; objectionable on account of paraffin taste; for a child two years old; sometimes succeeds.

*Carbolic acid* gr. ½, or creasote ℥i., t.d.s., in mucilage and syrup, some give more to a child two years old; not good.

*Succus hyoscyami* ℥xx., t.d.s., for a child two years old; perhaps of equal value with succus conii.

*Extract of cannabis indica* 7 grains, extract of belladonna 3½ grains, alcohol and glycerine aa. ʒi.; five drops of this for a child one year old; repeated as may be necessary (Vetlesen); deserves a trial in obstinate cases.

## II.—Drugs that act on the *larynx*, *pharynx*, and *fauces*. *Anæsthetic*, *astringent*, and *antiseptic* (usually all three).

*Alum* one grain every hour in ten drops of glycerine and water ʒi.; during the final stages, when there is no complication; two to six grains less frequently may be prescribed with honey; many authorities aver it is useful in all stages; the topical effect is aided by the glycerine.

*Silver nitrate* (gr. xx. to ℥i. of distilled water) applied by swabbing or brush to the larynx and parts around; it may be sprayed with steam (gr. xxx. to ℥i.); two or three times a day; I have seen these used with good results.

*Glycerine of tannin* and glycerine of iron (equal parts of iron perchloride and glycerine), applied by brush or swabbing with mop; four or five times a day.

Drinking freely of lime water is of but little value.

*Gargles of various astringents*—alum, tannin (gr. x. to ℥i. each); raspberry vinegar are sometimes useful.

*Anæsthetic.*—Hydrochlorate of *cocaine* four per cent. should be applied cautiously, locally, two or three times a day; the brush should not be over-charged.

It may be sprayed into the throat and nose by Siegle's apparatus; this agent should be used with considerable caution, especially in infants, for fear of toxic effects; chloral is said to relieve the toxic symptoms.

*Antiseptic*, killing the germs the alleged causes of the complaint.—One-per-cent. solution of resorcine applied by means of brush to all parts of the nose and throat, every two hours, night and day; sprays of two-per-cent. solution are used.

*Turpentine*, *eucalyptol* or *thymol* ʒi. to ℥iii. of spirits and ℥vii. of water; given by inhalation of the vapour; these should be vaporized from a clay or metal basin; the vapor cones of the North Hants Co. may be used; the vaporization should be practised in a small chamber in which the child should sit.

III.—Drugs which act on the **nasal** mucous membrane, either simply anæsthetic or astringent, and if the latter also antiseptic; powders may be insufflated several times a day; a simple insufflator may be formed of a narrow piece of pipette tubing; these drugs are used on the theories that the disease (1) starts in the nose, (2) is due to germs, (3) the paroxysms are caused by reflex action from the nose.

*Powders.*—Finely powdered *boric acid* and finely triturated roast coffee, equal parts; *quinine sulphate*; powdered benzoin; *salicylic acid*; bromide

of potassium. *Iodoform;* tannin; bicarbonate of soda; carbonate of lime. The quinine may be mixed with these in various proportions; those in italics are the most useful; they must be repeatedly used; some say every hour; such believe that hooping cough at the outset is a reflex nasal neurosis.

*Inhalation of vapor.*—Nose and mouth inhaler of perforated zinc (Maw's) with cotton wool on which 15 or 20 drops of carbolic acid are sprinkled; it may be used two or three times a day for an hour each time; be on the outlook for carbolic poisoning.

*Syringed into nostrils.—Antiseptic: Salicylic acid* 1 in 1,000, or corrosive sublimate 1 in 5,000; two or more times in the night or during the day.

*Anæsthetic.*—Two-per-cent. solution of *cocaine* applied by the brush; it may be used by soaking a piece of antiseptic wool in the four-per-cent. solution, and placing this in the nostril.

IV.—Drugs which act chiefly on the *bronchial mucous membrane.*

*Senega* (stimulant expectorant) instead of ipecacuanha; 3ii. of the infusion every three hours or ℥xv. of the tincture; it should not be used with acute febrile bronchitis, or when the stomach is irritable.

*Trochisques Vichot*—a French pastille—(Roberts, 76, New Bond Street); fumigation is practised under a tent bed; one burnt twice a day; each lasts about an hour (Goodhart).

*Stockholm tar* burnt by putting a red hot poker into it; the child is to breathe the vapours; the air around *gas works.* It is doubtful whether these last three act purely locally or after being absorbed.

*General disinfection* is said by M. Mohn to be an instantaneous cure for hooping cough. The affected child or children are suitably clothed in bran-new articles of dress and sent away to another part of the town; the bedchamber and living-rooms are then arranged for sulphurous acid fumigation; everything that cannot be washed is left in the rooms to be sulphurized—the bedding, the toys, the clothes, etc.; about an ounce of sulphur for every cubic metre of space is the quantity of sulphur to be burnt; the room is left sealed for five hours; then freely exposed to the atmosphere; after thorough ventilation the children are allowed to return and sleep in the disinfected apartments.

## MEASLES.

Although measles spreads with the greatest rapidity from one child to another, still isolation should be practised;

quarantine should be begun at the catarrhal onset; about a fortnight has to pass by before it is known whether other children will take the disease or not; a child who has had measles should not be considered free from infection till 20 days after the appearance of the rash have elapsed.

The diagnosis of measles is not usually difficult; it has been confounded with scarlet fever, German measles, small-pox, simple catarrh and simple roseola. A little attention to the history, and to the appearances at the time of illness, should prevent error; but error may occasionally be permissible; the coryza, injection of the conjunctiva and high fever may be caused by simple catarrh especially in *some* neurotic children; and if there be no measles in the neighbourhood the diagnosis cannot be established till the fourth day has passed; the palatal hyperæmia—rash in the throat—is not of decided diagnostic value; the measles rash is said always to come out first in the palate and fauces; the rash comes out first, at the roots of the hairs of the forehead though the face may all be involved when the child is first seen; its mulberry tint and papular form are generally decisive; the papules may suggest small-pox; the temperature goes rapidly down with the eruption of variola, whilst it usually rises further with the appearance of the measles rash; the papules of true variola rapidly vesiculate and umbilicate.

Remember that measles sometimes takes on anomalous modes of appearance; the rash is rarely delayed, and the head, though usually, is not always the first seat of the eruption. As to roseola there may be a mistake about the rash, but catarrh and fever are absent in it. Rötheln causes some soreness of throat and redness of conjunctiva, but enlargement of the glands behind the sternomastoid and in the post-cervical region generally affords a diagnostic indication, as also does the subsidence and reappearance, on the fourth or fifth day, of the sore throat. It is permissible to

confound mild measles with rötheln, unless there be a distinct epidemic of the latter disease at the time and in the neighbourhood. An uncomplicated case of measles requires but little special **treatment**. The patient, if treated at home, should occupy the top-floor, and have a large, airy room free from draughts and free from superfluous furniture (see general instructions for Treatment of Fevers). He should be in bed whilst the rash is out. The *complications* of measles require care and attention: Bronchitis and catarrhal pneumonia, diarrhœa, laryngitis, otitis and ophthalmia, convulsions, epistaxis. For the treatment of these complications, consult the articles on these different diseases. Much fever a few days after the rash has come out usually goes with some chest complication. The *sequelæ* of measles are diarrhœa, large bronchial and tracheal glands, gangrenous stomatitis, diphtheria (often fatal) and noma vulvæ. Tubercle and hooping cough frequently follow. Measles spends its fury chiefly on the hypoblast and leaves its legacies to the mucous membranes and the lymphoid mesoblast; scarlatina throws its stress on the epiblast, from which the kidneys and skin are derived, and leaves its legacies to the arterial section of the mesoblast. The knowledge of the tendency to catarrh of all the mucous membranes should prove a warning against the employment of irritants, especially purgatives, and should constitute a plea for protection by suitable clothing of the corporeal surfaces. The diarrhœa of measles is usually of the simple catarrhal form, though apt to degenerate into the dysenteric variety. If there is photophobia the room should be darkened. The sponging of the surface of the body is useful to relieve itching and to keep the mouths of the glands free from obstruction.

*Convalescence.*—The child may get up, if there are no complications, as soon as all fever has subsided; it should not leave the room till one week after the disappearance of fever;

it should not leave the house for three weeks. Every care should be exercised to prevent chilling of the surface during convalescence, for some of the most obstinate chronic diarrhœas and lung catarrhs may be easily perpetuated; the greatest caution is required with the feeding during this period; it is the old story of children's dietetics—the avoidance of excess of food and especially of fermenting substances, *e.g.*, starches, sugars. A convalescent stomach, pancreas and duodenum must be fed with small quantities and not too frequently, so as not to tax their still small powers. Bathing, cold douching, and clothing are considerations needing all the attention elsewhere described. Good sea air or a dry inland climate, tonics of nitric acid and infusion of cinchona, may round off the treatment. The scrofulous child after passing through measles should take cod-liver oil and steel wine if anæmia is present; sea air is generally best for them; cod-liver oil should not be given if there is vomiting or diarrhœa.

Remedies for the **cough** of measles.—All coughs may be increased in severity and frequency by a disordered stomach, bad feeding, deranged bowels and by an impure atmosphere and blood; the treatment of a cough should not be purely local; the chief cause of cough may be laryngeal or tracheal; there may be other aiding and abetting percentage causes.

*Internally.*—Sedative: Tinct. Camph. Co. ℥x., every four hours for a child two years old; Dover's powder, chlorodyne and bromides are used.

*Expectorants.*

℞ V. Ipecac. ℥vi., or Aceti Scillæ ℥v., or Oxymel Scillæ ℥v.
Glycerini, ℥v.
Spt. Æth. Nit., ℥vi.
Aq., ʒii., t.d.s. for a child two years old.

The squills should be used if the cough is loose, the ipecacuanha if the cough is hard. Inhalations of iodine and tincture of benzoin are useful

for the hoarse, hollow cough which is sometimes associated with the bronchitis—a dram of either tincture to the pint of boiling water. Aconite and veratria have been employed in minim doses when the bronchitis is severe, but they must be used with the utmost caution.

*Local applications to throat and larynx* by mop or brush; glycerine of tannin, boracic acid, carbolic acid, or simple glycerine; these tend to prevent the formation of membrane.

*External applications to neck.*—A sore throat and laryngeal catarrh are relieved by frequently renewed warm or cold wet compresses under oil silk. If the cough is croupy or attended with stridor, a hot fomentation, or a sponge dipped in very hot water and suddenly applied is good.

*Balneology and inunctions;* the indications and objects are pretty much the same as for scarlet fever (p. 480).

A cold affusion to the head is valuable at the commencement of measles if there is much stupor or a tendency to convulsions. The temperature should not be allowed to go beyond 102°; tepid sponging may easily reduce it two or three degrees; this and a cold wet pack may bring sleep, allay itching, and reduce temperature or cause the evolution of a receding rash; sudden retrocession of the rash may also be treated by a mustard bath, which is best if the pulse is failing.

For the treatment of hyperpyrexia, which is rare, see p. 471.

*Ophthalmia.*—The eye should be shaded from light; thoroughly syringed with warm water, or the water may be run into the conjunctival sac from a clean mop of salicylic wool; biborate of soda gr. x. to ʒi. may be used three times a day mixed with an equal part of warm water; the margins of the lids should be greased with a weak yellow ointment of mercury. Any antiseptic wash may do for the cleansing above mentioned.

*Diet and stimulants.*—Nothing special; plenty of bland fluids, such as barley water flavoured with aniseed and sweetened with sugar; milk and barley water; boiled entire wheaten flour or Mellin's food, with broth, blanc mange and jelly, may be given whilst the fever lasts.

If *diarrhœa* supervenes, milk and solids may have to be withheld; light broths, whey or barley water may be given cold for a day or so; excess of food of any kind should be avoided, saccharine and farinaceous articles more particularly; the diet should be regulated as described under Diarrhœa or Severe Diarrhœa.

*Severe diarrhœa.*—(See p. 316.) A mustard leaf for ten minutes, then hot fomentations, frequently changed; or cold wet compresses to cover

the whole surface of the abdomen and changed every few hours; the cold compress is best for children; hot applications for infants; the belly should be swathed in flannel or cotton wadding, placed over the application. The bowels should be opened by a small dose of castor oil, and then the Mist. Ol. Ric. c. Opio used regularly; stimulants of brandy in doses of a few drops may be required.

Dilute sulphuric acid and opium, small doses of rhubarb and soda mixture, ipecacuanha and fluid magnesia in small doses are sometimes suitable remedies for checking the diarrhœa of measles.

Brandy or other stimulant may be required for the complications; the signs suggesting stimulants are the same as usual: rapid feeble pulse, drying tongue if the mouth is not kept open, muttering brain, great sweating.

To prevent *exhaustion* or adynamia in severe broncho-pneumonia with an over-taxed right heart, stimulation is necessary: brandy, wine, ammonia; digitalis, etc., see p. 185; carbonate of ammonia, gr. ii., for a child two years old, in milk; it should be given every three hours if there is much exhaustion; sal volatile, ℥x., for a child two years old, in syrup and water; tinct. digitalis, ℥ii., for a child two years old, in glyc. and water.

*Otorrhœa* is treated on the same antiseptic principles and methods as for scarlet fever; its dangers are indicated at p. 447.

*Antipyretics.*—Quinine in fair sized doses, gr. v. for a child three years old, is good; the bath, pack or sponging should be preferred; some give quinine in small doses frequently.

*Malignant* measles with a badly developed rash is best treated by the hot mustard bath; there is usually an association of deep congestion of the internal viscera with a tendency to severe bronchitis, atelectasis, and broncho-pneumonia; in such cases abstraction of blood by many leeches (six or eight) over the heart may be needed; free stimulation with brandy and watery purgation by compound jalap powder is a good combination of opposites.

Sometimes the pulmonary complications are alarming after the rash has been out and is fading; venæsection should not then be practised in children under the age of seven, unless the hot bath with mustard and mustard poultices, dry cup-

ping and free stimulation have been first tried; reaction from this collapse should be the ambition; the removal of much blood might frustrate this object.

## ROTHELN, OR GERMAN MEASLES.

If a child take rötheln from another, about one week must elapse before the disease appears; there is nothing but tepid sponging to be done for the itching papular rash; the subjective sensations accompanying injection of the conjunctivæ may be relieved by darkening the room, as in measles; the desquamation of the skin is no more but even less than that of measles, and requires only a warm bath every day to assist the removal of the cuticle; neither the fever nor the cough needs special attention; the sore throat may relapse, and be attended with much viscid secretion about the fauces, which is best treated by gargling with warm chlorate of potash solution ʒi. and glycerine ʒii. to a pint of water, or in younger children mopping out the parts with a sponge mounted in a sponge-holder, or with lint wrapped round a stem. The enlargement of the glands usually subsides in due course; if not their reduction may be aided by wet compresses or painting the skin over them daily with tincture of iodine; a saline purge is best to relieve constipation —Carlsbad, Eno's salts or fluid magnesia. The *diagnosis* has to be made from measles by the smaller size of the papules, their non-cresentic arrangement, the swelling of the post cervical glands, an enlarged gland over the mastoid process is rather characteristic; slight fever and the appearance of the rash within a day of the feeling of malaise, if there is such.

## VACCINATION.

Any infant which is suffering from skin eruptions or is seriously debilitated, or which is out of health in any way, should not be vaccinated. The vaccination may not only

aggravate existing disease, but may itself fail; or a futile attempt may even render the organism insusceptible of proper vaccination. Vaccination with the human virus is best; done in five places on the left arm, above the level of the insertion of the deltoid. Virus immediately collected on the lancet from the seventh-day vesicle of another healthy child should be used; dried virus on ivory points or virus kept in Husband's capillary tubes may have to be employed; the virus must come from a transparent vesicle; blood must be absent from the vesicle, and must not be drawn in collecting the virus. A successful vaccination evolves in the following order: A papule at the end of the second day, and a vesicle at the end of the fifth day, then the vesicle extends in area till the eighth day, when it should still be full of clear lymph. As the contents become turbid about the tenth day, a red areola forms around the vesicle, and the base of the vesicle becomes indurated. Gradually the pustule thus formed subsides, and a scab is formed by about the fifteenth day. The depressed circular scar after detachment of the scab is seen on the twenty-first day. This order is the rule, but sometimes the succession of phenomena is delayed, sometimes accelerated, and sometimes perverted. Delay is natural when calf lymph is used, or when the vaccination is performed during the incubation period of an acute specific fever. Acceleration is usual when revaccination is performed. The only **treatment** of vaccinia is to protect the arm and its sores from irritation and dirt, which cannot in infants be effected by the employment of mechanical apparatus. The fever attendant on the vaccinia is generally slight and seldom requires any bathing or sponging; a dose of castor oil if the tongue is furred, or the bowels constipated, or the child restless, is all that is usually required. The erythema which frequently attends the vaccinia may spread widely, but does not need anything more than a weak lotion of carbolic acid,

one in a hundred, or Liq. Carbon. Deterg. ʒi. to ʒiii. to relieve the itching. Erysipelas rarely develops, though a few vesicles may stud the erythematous surface; the glands in the axilla being tender require that the arm should be kept quiet and free from knocks or movement; after vaccination with calf lymph, I have frequently seen enormous enlargement of the axillary glands, which I treated by hot fomentations and glycerine of belladonna paint; occasionally actual abscesses and deep ulcerations form; I have also once seen paralysis of the extensors of the forearm result from this enlargement, which subsided slowly; the faradic reaction of the muscles was diminished, but never abolished. Vaccinial vesicles may be found on the face, buttocks, and other parts, as the result of accidental inoculation; sometimes the erythema is of erysipelatoid character, and may be widespread and migrating in its character; Ringer strongly recommends aconite, given in the usual doses, for this inflammation; belladonna paintings should also be employed twice daily; the parts should be covered with cotton wool and a bandage to prevent the atmosphere participating in the process.

## SMALL-POX.

The mortality of small-pox in children under five years of age is extremely high; the disease may have to be distinguished from measles, scarlatina, and possibly varicella.

Measles may be confounded with small-pox, since there is in both a period of fever preceding the eruption, injection of the conjunctivæ, and a dusky papular rash on the face; the severe vomiting, high fever, and loss of control over the sphincters are more common with small-pox than measles or scarlet fever; cerebral symptoms, which usually partake of the character of stupor and convulsions, are more marked and more frequent in variola; a scarlatiniform rash sometimes attends the pre-eruptive stage of small-pox, and lends a

spurious likeness to scarlatina; the rash is usually less scarlet, less extensive and less punctiform; in contradistinction to measles, the appearance of the eruption in variola is attended with a lull in the symptoms, and a decided fall in temperature; the period of incubation is precisely twelve days.

The **treatment** of small-pox is many-sided; at the outset the diagnosis is the treatment; the wet pack may be used should the rash recede; isolation must be practised with promptness; the room must be very large and very airy; sail as near to the wind of catching cold as you dare; for the presence of abundance of fresh air decidedly diminishes the risks from suppuration of the pocks; it is true that fresh air and light promote the maturation of the individual pocks, but the actual number and intensity of these is diminished by a free supply of cool air; the temperature of the room may with advantage fall to 50° or even below.

The pocks require treatment on the second day after their appearance; they should be protected by flexible collodion or traumaticine, and the room should be darkened. Some recommend the application of solid nitrate of silver to each pock; others, covering the pocks with mercurial plaister, or some other material. The principle is to protect them from the action of light and air; nitrate of silver does this by forming an insoluble albuminate; a solution of this salt, gr. xx. to ʒi., may be simply painted on the pocks, or some advise the pocks to be pricked with a needle dipped in this solution. Later on the irritation of the eruption demands treatment; the child's hands should be muffled, and the eruption anointed with sweet oil, spermaceti ointment, or cold cream.

The *eyes* may suffer considerably; if there is mere conjunctivitis, frequent bathing by dripping warm water from a sponge should be practised so as to clean the conjunctival sac; a solution of nitrate of silver gr. i. to ʒi., or sul-

phate of zinc gr. iii. to ʒi. may be run in or syringed in. Then anoint the margins of the lids with castor oil or sweet oil; the eyes may require treatment every few hours, according to the amount of the discharge. If the inflammation is severe, a strong solution of nitrate of silver gr. x. to ʒi. may be brushed once over the inner surface of each eyelid, and immediately after warm water should be run over them; corneal ulcers may form, and the iris may become inflamed; for the first the treatment consists in the use of the solid stick of nitrate of silver, and for the second a lotion of atropine (see "Nettleship on Diseases of the Eye").

The *fauces* and neighbourhood may require gargles, if the child is old enough to use them; the practitioner may have to syringe out the mouth and remove accumulations of mucus; Boracic Acid ʒi., Potass. Clor. ʒi., and Glyc. ʒi., to half-a-pint of water is a useful lotion; hot fomentations or poultices may be used externally; and also for hoarseness or loss of voice, which is a sign of the presence of pox in the larynx; the steam spray with carbolic acid (one part of one in twenty carbolic acid to four parts of water), or burning vapour cones of carbolic acid and camphor may be employed under the cover of a tent-bed; but the complication is a serious one, and may need tracheotomy, though the case usually ends fatally.

There is danger at three chief times in the course of severe small-pox; (1) for the rapid supervention during the *early* stage of coma and convulsions, nothing effective can be used except icebags and free bleeding, which could only be done on trial, and to appease the parents; such cases are said to be always fatal; collapse at this period must be treated by hot mustard baths and the administration of brandy and ammonia, and even the subcutaneous injection of ten drops of ether.

(2) Collapse may set in suddenly during the *second* or

*third* day of the process of maturation of the pocks; this is heralded by increased restlessness, and soon followed by sudden subsidence of the swelling of the hands and face, and by the appearance of pallor of the skin in between the pustules; the vesicles or pustules share in the general collapse, and often sink down themselves; the demand for stimulants and nourishment is of the greatest urgency—brandy or wine, or champagne, beef tea thickened with Mellin's food and meat essences. (3) Another critical time is about the *fifth* day of the eruption and the eighth day of the disease; the shout for stimulants is less sudden, the danger is more from sheer asthenia than actual collapse, but the remedy is the same—free stimulation and nourishment.

The thirst of small-pox should be relieved by lemon-flavoured barley water or other mucilaginous drinks, which may soothe the distress occasioned by the sore throat; the bowels, of course, need attention, but no special treatment; a tea-spoonful of castor oil to open them, or a few drops of the oil in mucilage, with a drop of laudanum should they be too open, may suffice. Restlessness and sleeplessness usually indicate stimulants and food, or attention to the skin which is causing irritation; but a little opium is frequently beneficial even for children; a few drops of chlorodyne (mv. for a child five years old) induces sleep and promotes a healthier state of the cerebral cortex.

The formation of abscesses should be followed by their speedy evacuation, and by an increase in the nourishment. Hæmorrhage into the pocks is an indication for further stimulation and nourishment; it is not of such serious import as when in the early period, hæmorrhages occur into the skin, from the bowel, along with the urine or from the nose; these hæmorrhages are usually attended with rapid collapse; the hot bath is the only means of treatment, yet it is not likely to do much good.

*Cleanliness* is of the utmost importance during the whole course of the eruption; the linen of the body and of the bed should be regularly renewed, and the body should be washed every day by sponging with tepid water. The nostrils must never be allowed to become occluded by scabs; the scabs must be removed and the raw surface beneath treated with antiseptic and soothing remedies; a weak solution of carbolic acid or carbolic oil is as good as anything, or this may be alternated with zinc ointment if there is any fear of absorption of the phenol; scabs anywhere, but especially on the scalp, should not be allowed to remain, but should be removed, and the sore beneath cleansed and anointed with an ointment of diachylon or dressed with a wet dressing of red lotion if the granulations are indolent.

℞ Lotio Rubra.
Sulphate of Zinc, 2 grains.
Comp. Tinct. of Lavender, 12 minims.
Water, ℥i.

℞ Ung. Diachyli.
Litharge, 3 parts.
Olive Oil, 4 parts.
Lard, 2 parts.
Yellow Wax, 1 part.
Eucalyptol, 1 part.

The *bronchitis* which may attend small-pox may be excited by the presence of pocks on the bronchial mucous membrane; if it is severe, the usual remedies for bronchitis may be employed, but not those belonging to the depressant department; indeed, free stimulation with brandy and ammonia and the use of the carbolic steam spray is better than giving special expectorants.

During *convalescence*, the seaside, cod-liver oil and iron are to be recommended, and all the more so if the child has

developed pulmonary complications or comes of consumptive stock.

## CHICKEN-POX.

It is ordinarily said that varicella requires no treatment; this is not strictly true; the intolerable itching of the developing vesicles may be allayed by sponging with rather hot water, care being taken not to break the vesicle; scratching and picking must not be allowed; it does not often occur, but bear in mind that the rapidly formed vesicles of varicella may take on an ulcerative or gangrenous character, and may lead to a fatal issue by the gate of hæmorrhage, pyæmia or exhaustion. If, therefore, the child is weakly and ill-nourished, a supporting plan of treatment is most necessary, though the malignant varicella is occasionally found in chubby children; in most necropsies of such cases tubercles are found in the internal organs.

Mistakes are made in practice in the differential diagnosis of varioloid and varicella; forget not that ulcers, resulting from vesicles, occur not only in small-pox, but also in varicella, on the mucous membrane of the mouth, fauces, soft palate and pharynx; the eruption often appears first on the palate and fauces; moreover, light does not mature the glass-pock; the hairy scalp and shoulders are frequent seats of vesicles; there is no true umbilication in the vesicle of varicella.

Abortive varicella or vesicles may be papular; and papules may be nearly but not quite vesicles; *practically* it is unreasoning to speak of varicella prurigo, or of persisting or relapsing varicella.

The **modified** small-pox eruption is usually preceded for three days by severe symptoms—fever, lumbago, and vomiting. The onset of varicella is far less severe; the eruption appears as small, not shotty papules which usually vesiculate within six hours; successive crops of vesicles

appear for several days together ; the disease lasts about ten days ; the patients should not mix with other children ; two weeks should elapse before the practitioner can say that others have not taken the complaint ; no medicines are required ordinarily ; the fever hardly needs notice, though the temperature must always be taken ; at the end of the disease the temperature of the body has a tendency to be lower than natural.

After the complaint has disappeared a change of air to the seaside may be recommended, especially if the patient comes of a scrofulous stock ; a few minims of the fluid extract and ʒii. of infusion of cinchona with some glycerine t.d.s. is the best tonic. Ointments may be used to prevent itching and remove scabs : vaseline, zinc ointment, etc. A few grains of citrate of potash, or small doses of liquor ammoniæ acetatis, or bitartrate imperial (bitartrate of potash ʒii. to Oi. water sweetened with sugar and cinnamon water) may be given as a diaphoretic and diuretic, and the last may perhaps open the bowels ; a little jalapine, gr. ii. in a pillule or a dose of fluid magnesia sweetened with syrup of orange, may be given as an aperient ; whether the pocks come out in the mucosa out of sight is unknown ; yet violent purges should not be used.

## EPIDEMIC MENINGITIS.

There is no need to waste space on a description of epidemic cerebro-spinal meningitis which doubtless occurs in attenuated form in this country ; Plate III, shows a great degree of opisthotonos ; the symptoms are like those detailed under Meningitis and Cervical Opisthotonos.

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