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MANUAL OF DISEASES OF CHILDREN

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MANUAL

OF

DISEASES OF CHILDREN

BY

JAMES BURNET, M.A., M.B., M.R.C.P. (EDIN.)

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1905

PREFACE

THE importance of a knowledge of the diseases of infancy and childhood cannot be over-estimated. At the present time their study is almost entirely neglected by the student and general practitioner in this country. The reason, no doubt, is that until quite recently these diseases were regarded as undeserving of special study. It was left to workers in America and on the Continent to break down this false belief, and to open up for us a wide field of new and intensely interesting research. To these pioneers we owe much, as well as to those of our own countrymen who have already given themselves up to the study of pædiatric science.

The object of the present volume is to give a brief outline of this vast subject to those who are beginning its study for themselves. Students, and even practitioners, have often but little time for the reading of the larger and very excellent treatises on children's diseases which have been published within the past few years. They need some such small text-book as this to aid them in their earlier searches after knowledge. Our aim throughout has been to avoid theoretical discussions, and even the morbid anatomy of the various diseases referred to will be found conspicuous by its absence. The latter

omission is intentional, as we believe that the various morbid changes can only be studied to advantage in the post-mortem room.

We have included a brief consideration of diseases of the skin and also of the nose, throat, ear, and eye, as these various conditions are so frequently met with in practice, and are, generally speaking, often misunderstood, or at least badly treated.

It has been difficult to determine how much to include and how much to omit; but it is hoped that a careful study of the volume as a whole will serve to lay a good foundation for further reading and observation on the subjects of which it treats.

JAMES BURNET.

20 Polwarth Crescent,
Edinburgh.

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DISEASES OF CHILDREN.

CHAPTER I.

THE EXAMINATION OF SICK CHILDREN.

THE successful examination of a child who is ill is perhaps one of the most difficult and trying processes that the practitioner has to face. The key to success lies in the possession of an extraordinary degree of child sympathy and patience. Even an infant is able to recognise at once the difference between a sympathetic and an unsympathetic manner on the part of the examiner. Any attempt to get the examination over quickly is sure to meet with failure. Every child resents rough handling, which a hurried examination is bound to entail.

It is absolutely imperative that the child should be completely undressed during the process; otherwise, it is quite impossible to make the diagnosis complete. In the case of infants and young children the examination will be most easily conducted by having the patient rolled in a blanket and placed in the nurse's lap. The examiner should at first appear to take no notice of the patient, and address his questions to the parent or nurse. When he has obtained a sufficient amount of information to guide him to a probable cause for the illness he should approach the child quietly; and in no case should he proceed at once

to a physical examination until he has in some measure gained the patient's confidence.

Although in the case of children physical examination according to a rule of thumb method is seldom possible or even advisable, it is well, perhaps, that the practitioner should have some definite guide so that his examination may be at once thorough and complete.

Before examining the patient the physician should question the parent or nurse regarding the history of the present illness. He should inquire when it began, and whether the symptoms appeared suddenly or came on more gradually. The exact symptoms should then be ascertained. It is well to inquire whether or not there has been any illness immediately preceding the present attack. Having obtained the desired information the examination of the patient should then be proceeded with. If the child seems feverish the temperature should be taken, and while the thermometer is in its place the general appearance of the patient should be noted. The general nutrition, the patient's attitude, the presence of any anæmia or other morbid condition, such as jaundice, the character of the cry or voice, and of the cough, if any is present, are all points to which attention should be paid. Having taken the temperature, if the patient is an infant evidences of rickets should be looked for, such as the general shape of the head, the condition of the anterior fontanelle, the presence of craniotabes, rickety rosary, and enlargements of the epiphyses. When some general idea has been formed as to the condition of the patient, a detailed examination should then be made of that portion of the body which seems to be affected.

In connection with the *head* we note its shape and size, the condition of the anterior fontanelle, the presence

or absence of craniotabes, the shape of the jaws, the number and condition of the teeth, the state of the bridge of the nose, and the presence or absence of any discharge. An examination of the ear and eye may then be made. In examining the neck we look for any enlarged glands and note the condition of the thymus and thyroid.

Passing to the *chest* we begin our examination by careful inspection. We count the number of respirations, and note whether there is any indrawing of the interspaces, and if so whether or not the alæ nasi move with respiration. We next auscult the back by preference, as it is in this part of the chest that we are most likely to catch the physical signs of bronchial and pulmonary disease. Percussion should follow auscultation. Finally, the apex beat should be palpated for; and we conclude our examination of the chest by noting whether or not the heart is enlarged, and by listening for any murmur which may be present.

Turning our attention to the *abdomen*, we note its shape, more especially with regard to its prominence. By careful palpation much useful information may be gained, as also by percussion. Before completing our examination of this region, we should observe whether the liver and spleen are enlarged or not.

Our examination proceeds to an investigation of the *limbs*, and we note any abnormality of shape, the presence of œdema or swelling, the condition of the joints, and the presence or absence of pain.

In many cases it may be necessary to make a minute examination of the *skin*, and the scalp very often is the seat of disease. In some cases also the examination of the *blood* may be helpful in forming a correct diagnosis. The pulse is not as a rule of much help in diagnosis, but if

possible its rate and rhythm should always be made out. In all wasting diseases it is important that the patient's weight should be taken.

In children, as in adults, an examination of the *urine* is often of very great importance, and this must never be omitted in any case of serious disease. A *rectal examination* is a matter which might receive more attention than it does. It is only by this means that we can often tell the true nature of the patient's illness. Thus by rectal examination we can diagnose tuberculous peritonitis, appendicitis, diseases of the generative organs in the female, intussusception, polypus, anal fissure, the presence of foreign bodies, and last, but by no means least, constipation.

Before completing our examination of the patient the *throat* should be carefully inspected, any enlargement of the tonsils, and the presence of pharyngitis or of adenoids specially noted. Last of all the condition of the *teeth* should not be overlooked, as dental caries is a frequent source of ill-health in many children.

In diseases of the Nervous System a special method of examination is usually necessary, but this will be considered fully when we come to speak of this class of case (*vide* Chapter XIV.)

CHAPTER II.

SOME POINTS OF DIFFERENCE BETWEEN CHILDREN AND ADULTS.

CHILDREN differ from adults in many respects. We shall here consider those points of difference which are of special clinical interest.

Anterior Fontanelle.—At birth the anterior fontanelle measures about an inch each way. It remains much about the same size until the end of the first year, when it steadily begins to diminish. It should be completely closed about the eighteenth month. If there is still a marked opening at this time, one of three conditions is indicated :—

1. Rachitis.
2. Cretinism.
3. Hydrocephaly.

The Circumference of the Head.—This measurement is of importance in certain conditions, more especially in hydrocephaly.

The circumference at birth is	.	.	13 inches.
„ „	one month	.	15 „
„ „	six months	.	16 „
„ „	twelve months		18 „

Mental and Physical Development.—The following

dates are important in the developmental history of the infant:—

Third month . . .	Begins to take notice.
Fourth month . . .	Holds the head up.
Sixth month, or later .	Sits up with support.
Sixth to ninth month .	Cuts first teeth (incisors).
Tenth month . . .	Is able to stand.
Twelfth to eighteenth month	Begins to walk.
Twelfth month . .	Begins to talk.

Height.—The average height of the infant at birth is 20 inches, but during the first two months of life the increase in height usually averages about 1½ inches per month. During the first year there is a total gain of 8 inches, thereafter the child continues to gain about 2½ inches each year, so that when six years old its height should average about 3½ feet.

Weight.—The actual weight of the infant or child is not nearly of so much importance as a loss in weight, while in the case of infants the fact that the weight remains stationary may be indicative of malnutrition from improper feeding. Actual loss of weight is often a valuable index as to the commencement of some disease of which no symptoms may as yet be present; it may also mean that the child is not thriving. Loss of weight is apt to be very rapid during infancy and early childhood, as at this period of life metabolic changes are very active.

At birth the weight of an average healthy infant is 7½ lbs. During the first few days it tends to lose in weight, but by the end of the first week begins to gain again. The following gives in the form of a table the gain per week during each monthly period of the first year of life:—

	Gain per week.
During the first three months . .	6 oz.
„ second „ . .	5 „
„ third „ . .	3 „
„ fourth „ . .	2 „

When the infant is a year old he should be nearly three times his weight at birth.

Pulse.—The pulse of infants and young children must not be too much relied upon, as very slight causes, such as a fit of crying, will tend to upset the normal rate and rhythm. In children the pulse is often found to be irregular and intermittent at puberty, although the health of the child may be perfectly satisfactory.

The pulse rate during the first year may be stated as 120, during the second year as 110, and during the third year as 100 per minute. After the third year it is quite common to find a pulse rate of 85 to 90 until the age of fourteen. After this the pulse more nearly approaches that of the adult.

Respiration.—In the first few months of life the breathing is distinctly abdominal in type. Even in health the breathing of infants is apt to be somewhat irregular in character. It should be borne in mind that both sides of the thorax are rarely found to be quite symmetrical, and that during infancy and early childhood the ribs very readily yield to pressure either intrathoracic or from without.

At birth the respirations usually number 40 per minute, and during the first two or three years the breathing has always a tendency to be rapid. At five years the respiration rate will be found to be about 24, and at ten years about 20 per minute.

Temperature.—The temperature during the first two or

three weeks of life often shows a tendency to be slightly over the normal. Fluctuations of temperature, even to a considerable extent, are much more common in infancy and childhood than in the adult. A very slight cause, it may be an attack of colic, will send an infant's temperature up to 103 or even 104 degrees. The inference to be drawn from this fact is that a high temperature in an infant or a young child is not nearly of so much significance as a similar temperature met with in later life. These ready fluctuations of temperature are probably due to the extreme instability of the heat-regulating mechanism in early life.

Heart.—A considerable amount of discussion has taken place as to what constitutes the normal position of the apex beat in early life. From personal observations on a large number of healthy subjects we are able to state that the apex is usually found in the fourth interspace, and if the child is under five years of age it will be located outside the mammillary line. After this age it tends to lie either in the mammillary line, or, as puberty approaches, about half an inch internal to it. The breadth of the heart in early life is relatively greater than it is in the adult. The right border not infrequently is found to extend for three-quarters of an inch beyond the sternal margin, although the heart is perfectly normal.

Abdomen.—In young children the abdomen is unduly prominent. This is to a large extent due to the relatively large size of the liver, and also to the somewhat limited capacity of the pelvis. The abdomen may, of course, be enormously distended, especially in rachitic subjects, and a similar condition is met with in connection with dilatation of the colon.

Stomach.—The stomach of the infant differs in many

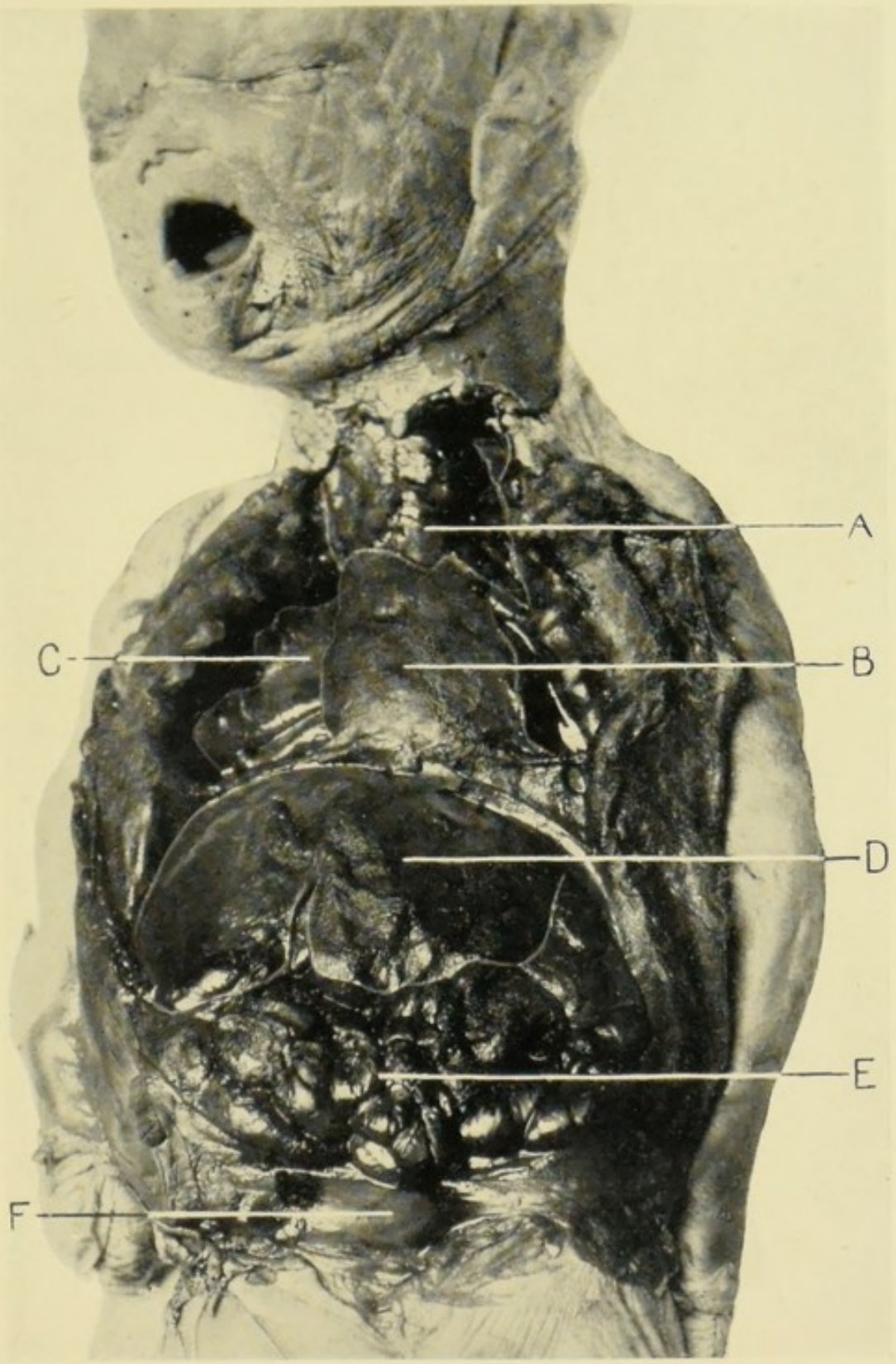


PLATE I. — Dissection of Still-born Full-time Fœtus. A, Thymus Gland; B, Heart; C, Right Lung; D, Liver; E, Intestinal Coils; F, Bladder.

To face page 8.

essential points from that of the child. It is more vertically placed, while in shape it resembles more the form of a dilated tube. In the early months there is no fundus present, in fact it is not till about the first year of life that the latter becomes at all well developed. Regurgitation from the stomach is easily brought about during infancy, not only on account of the position of the organ, but also because the œsophageal sphincter is but poorly developed. For this reason it is most important that infants after being fed should neither be moved about nor played with. The stomach tends to become more and more horizontal after the first year. It probably acts more as a receptacle for food material during infancy than as a digestive organ, a fact which is of some importance in connection with feeding.

The *capacity* of the stomach is a matter about which a great deal of ignorance seems to exist. The following table gives an approximate series of figures:—

	Oz.	Table-spoonfuls.
At birth	1	2
Two weeks	1½	3
One month	2	4
Two months	3½	7
Three months	4½	9
Six months	6	12
Twelve months	9	18

Liver.—During the first few years of life the lower margin of the liver can be normally felt about a half to three-quarters of an inch below the costal region anteriorly.

Spleen.—In infancy and childhood this organ occupies the same position as it does in the adult. It should be palpated for in every child presenting febrile symptoms,

as its enlargement may indicate typhoid. It is also enlarged in many other conditions, of which rachitis and congenital syphilis are two of the most important.

Brain.—In infants the size of the brain is relatively large, and it continues to increase fairly rapidly until about the seventh year. After this it grows more slowly. The whole nervous system in infants and children is more unstable and more easily influenced by external stimuli than in later life.

Lymphatic Glands.—These are more largely developed in young children than in the adult, and at the same time are more active. It is for this reason that their enlargement takes place from causes which may of themselves be comparatively trifling.

Salivary Glands.—There is not much salivary secretion until about the fourth month, though it is usually not until the fifth or sixth that a considerable amount is seen to trickle from the mouth, and in any case very little saliva reaches the stomach until about the end of the first year.

The amylolytic function of the secretion is certainly but slightly established until the infant is twelve months old. It is for this reason that starchy foods should not be given during the first year of life.

Thymus Gland.—At birth the thymus gland forms a comparatively large structure. It continues to grow until about the second year, when it begins to atrophy somewhat. The portion, however, which is situated immediately behind the sternum usually remains until puberty.

The Testicles.—Very often one or both of these remain undescended for some time after birth. It is usually the right testicle which is found undescended, and it may

readily be mistaken for a hernial protrusion. Probably an undescended testicle is not quite functionless, as its internal secretion no doubt influences bodily metabolism, and probably has a marked effect in regulating the body temperature.

The Thyroid Body is relatively larger in the child. Its atrophy leads to the development of cretinism.

The Kidneys are relatively large at birth; and the *Suprarenals* are also relatively large in the child.

Bladder.—It must be remembered that the bladder in young children is an abdominal organ, and has a distinctly ovoid shape. Its capacity is very much less in the child than in the adult, hence the greater frequency of micturition in the former. Control over the bladder is often obtained as early as the eighteenth month, and by the end of the third year healthy children are always able to control the bladder sphincter.

The specific gravity of the urine in children is lower than in adults and varies between 1005 and 1010. The examination of the urine is often neglected in childhood, but this is of quite as much importance as it is in the case of adults. It is well in difficult cases to make a thorough examination of the urine before coming to a final conclusion as to the diagnosis.

The Rectum forms more or less a straight tube in infancy, and occupies an abdominal position. The result of its want of curvature leads to its very ready prolapse.

Fæces.—For the first few days the infant passes fluid fæces resembling treacle and termed *meconium*. So long as only milk is fed to the infant the motions are of a honey-yellow colour, and may become yellowish green on exposure to the air. They assume a brownish colour when starchy food is given. At first the infant has two to four

motions a day, later two; and finally only one is passed. In infancy the motions have practically no odour, but if acid fermentation occurs they produce an offensive smell. If the stools are very large and bulky it means that the infant or child is not obtaining much nutriment from the food given, most of which is passed off as waste material.

CHAPTER III.

DISEASES OF THE NEWLY-BORN.

In this chapter we shall consider very briefly those diseases and abnormal conditions associated more or less closely with the actual birth of the child. This group may, for convenience, be headed *Natal Disorders.* It embraces a variety of conditions, some of more interest and importance than others, but all of them depending to a greater or less extent for their causation on the factors operating during the birth of the child.

Asphyxia Neonatorum is a well-known condition which comes under this group. In this state the lungs are either not spontaneously inflated at all, or not sufficiently fully to ensure the child's maintaining an independent existence. Asphyxia may present itself to us in one of two forms, viz. :—*A. Livida*, in which the child at birth is cyanosed, the heart's action strong, and the umbilical cord firm and distended ; or again *A. Pallida*, in which there are deadly pallor with feeble or absent heart impulse and an umbilical cord which is soft and flaccid. Of the two forms the first is the less severe, most cases recovering under the application of external stimulation, or at all events after artificial respiration has beeen resorted to. This condition of asphyxia may lead on to the establishment of the pathological condition known as *Congenital Atelectasis.* Infants affected with this want of pulmonary

expansion are weak and feeble. Their weight is below the healthy standard, and their limbs are usually blue and cold. Their cry is very faint and often inaudible. Often such infants develop attacks of cyanosis attended by convulsive seizures, to one of which the patient succumbs. The treatment of atelectasis is essentially preventive, by making the child cry well at and after birth. General friction and the maintenance of a normal body temperature are essential. Careful feeding and attention to cleanliness and fresh air will do much to ward off a fatal issue.

We shall now briefly refer to two forms of *Local Hæmorrhage* associated with the birth of the child. The first of these is *Cephalhæmatoma*. This is a blood tumour whose common situation is over a parietal bone. Most of these cases are attributed by the nurse and parents to injury caused by external force employed by the accoucheur. This view, however, is completely erroneous, as such tumours arise spontaneously, more especially in prolonged and difficult labours. It is readily recognised as an ovoid, soft, fluctuating mass without pulsation, and not at all affected by coughing or crying. As regards treatment little need be said as a cephalhæmatoma disappears as it originates—spontaneously—in a space of time varying from one to three months. *Hæmatoma of the Sterno-Mastoid* is a much rarer condition. It appears usually over the centre of the muscle. It is due to rotation of the head and neck during birth. It requires no active treatment, as it gradually diminishes and finally disappears of itself. It may give rise for a time to a slight degree of torticollis.

Certain forms of paralysis, commonly classified under the general heading of *Birth Paralyses*, demand attention.

A condition of *Facial Paralysis* is sometimes seen after the birth of the child. This may be due to pressure of the forceps during delivery of the head, but not infrequently we find paralysis present when delivery of the child has been left to Nature. Cerebral hæmorrhage may also involve the face fibres, but in such cases a complete hemiplegia is developed. The paralysis may be partial, that is to say, only involving certain muscles or groups of muscles. As a rule, however, and more especially in forceps cases, we have a typical facial paralysis established. When the child is asleep very little indication will be afforded as to the condition, unless perhaps by some defect in the closure of the eye on the paralysed side. It is when the child is awake, and more especially when crying or attempting to suck, that we notice the defective movements. In the greater number of instances recovery takes place within a fortnight without the adoption of any special treatment. If, however, the child's condition does not improve, then massage, and especially electricity, should be regularly and systematically employed.

There is a paralysis of the arm known as *Erb's Paralysis*. The group of muscles implicated comprises the biceps, supinator longus, brachialis anticus, and the deltoid. The appearance of the limb is quite characteristic. The arm is perfectly limp, and when raised it falls down again in a lifeless fashion. The hand is turned outwards, giving the whole limb a very marked and distinguishing character. Electricity is the only availing form of treatment, and the galvanic current is the one usually employed. Recovery may as a rule be looked for within three or four months; after that time more or less permanent paralysis may be expected.

Icterus Neonatorum is a condition often met with even

in healthy subjects. Various theories have been put forward as to its exact pathology, but with these it is perhaps inadvisable to attempt to deal. The jaundice usually disappears within a week or ten days, and calls for no treatment whatever. Icterus, however, of a much severer type, may also be met with especially when due to congenital defect in the bile-passages or to septic infection; in the former case it is usually very intense.

Affections of the Umbilicus are not at all uncommon. After the cord has dropped off we not infrequently find that the surface left is moist and soon becomes red and inflamed, while at the same time an exudation of semi-purulent material appears. This is usually the result of want of cleanliness on the part of the nurse. The treatment, accordingly, is prophylactic in the first instance by carefully dressing the stump with some antiseptic powder and placing over this salicylic absorbent wool. Should the parts have become moist and septic they should be thoroughly dried with absorbent wool, and freely dusted over with a powder composed of zinc. oxid., bism. subnit. and acid. boric. A dressing of boric lint should then be applied. If this simple condition is allowed to go on genuine *Omphalitis* may result, and abscess formation is by no means an uncommon sequel in such cases. In fact the risks attendant on septic conditions of the umbilicus are many, and, consequently, great care should at all times be taken in dressing the wound.

Affections of the Mamma.—The presence of a small amount of milky fluid in the mamma is often seen on the second or third day after birth. The medical attendant's notice is at once directed to this condition by the nurse who usually regards it as abnormal and calling for instant treatment. Nothing should induce us to employ

meddlesome interference here, as any attempt at massage of the breasts would be sure to lead to disastrous results. *Mastitis* may thereby be brought on. This may, however, arise quite independently and go on to the formation of an abscess. The treatment of such cases should be prompt and conducted on ordinary principles.

Morbus Hæmorrhagicus Neonatorum.—This is a curious condition, the cause of which is at present very obscure. Probably it is the result of some defect in the walls of the capillaries, akin to that which is met with in cases of hæmophilia in later life. Hæmorrhage may occur within a few hours of birth. It is maintained by some authorities that sepsis plays a very prominent part in the production of these hæmorrhages. A bacillus has been found in the blood which when injected into young guinea-pigs, rabbits, and puppies, has induced various hæmorrhages in these animals. The commonest sources of the hæmorrhage are the gastro-intestinal tract and the umbilicus, but it may come from the ears, eyes, or nose, and even show itself as subcutaneous extravasations. We have seen one or two cases, and in all of these intestinal hæmorrhage was the prominent feature. Recovery is the exception in this disease. Infants stand loss of blood badly, and consequently they usually succumb, so that treatment, even when energetic and immediate, is rarely effective. We are convinced, from practical experience, that sol. adrenalin chlor., aided by warmth and stimulation, is the only reliable therapeutic means at our disposal for dealing with these intractable cases.

Nasal Catarrh and a slight degree of *Conjunctivitis* are very frequently met with during the first few days of life. These are to be treated in the usual way, the former by applying some weak ung. bellad. over the alæ nasi, and

the latter by the use of boric acid lotion and ung. hydrarg. oxid. flav.

Some other affections of the newly-born, such as congenital defects and diseases of special organs, will be referred to under the chapters dealing with the particular region involved.

CHAPTER IV.

DISEASES OF THE RESPIRATORY SYSTEM.

COUGH IN INFANCY AND CHILDHOOD.

Cough as a symptom in the diseases of infants and children is so common, and so important, that it deserves separate consideration.

Etiology.—Cough may be due to quite a variety of diverse conditions. It may indicate the presence of laryngitis or of bronchitis, of pneumonia, or of pleurisy. Again it may be diagnostic of pertussis, especially if associated with vomiting. Cough likewise is a very common symptom associated with adenoids and enlarged tonsils. In the latter condition children often have a disagreeably irritating and dry cough, while at the same time the chest is apt to be badly formed, and the body as a whole thin and spare. Very frequently they are erroneously thought to be the subjects of incipient pulmonary disease, whereas their lungs, on examination, are found to be perfectly healthy.

Cough is also frequently seen in those who are the subjects of chronic dyspepsia, induced by improper feeding. Such children usually possess a very prominent abdomen, which gives a highly tympanitic note on percussion. Nasal catarrh is sometimes productive of cough, as is also an elongated uvula. In cardiac disease cough is very often

present, and in some cases may prove very troublesome. Wax in the ear sometimes provokes a short and harassing cough, which ceases as soon as the accumulation has been got rid of. In nervous children fits of coughing may be readily induced by any slight excitement, or by the presence of strangers in the room. Such children frequently have attacks of coughing at night or in the early morning, though they remain perfectly immune during the day. A case of this kind, which we can recollect, was that of a boy who alternated his paroxysms of coughing with fits of sneezing. These came on regularly every morning as soon as he was awake and ceased entirely after breakfast. In this particular instance no local disease could be made out, and as he grew older the fits became fewer in number, until they eventually disappeared.

Diagnosis.—The diagnosis of the cause of cough in a child is often a matter presenting the greatest difficulty. In every case a local examination of the chest, nose, throat, ear, and abdomen is necessary. When the cause cannot be found in the chest, the possibility of enlarged tonsils, granular pharyngitis, and adenoids should be remembered. In these cases as a rule the cough is worst at night, and the patients are often restless, take their food badly, and suffer from constantly recurring nasal catarrh. The likelihood of the cough being due to pertussis should not be overlooked. Vomiting is not always present throughout the course of this disease, but when one is told that the child brings up the expectoration the presence of whooping-cough should be strongly suspected, especially if the cough is worst at night, and the child's face becomes suffused during the paroxysm.

We have known a cough to be cured by the removal of

a ceruminous mass from the ear, and accordingly the diagnosis should not be regarded as complete, in doubtful cases, until this organ has been examined.

Treatment.—Sedatives must on no account be given, unless they are absolutely indicated. Usually some direct cause can be made out, and treatment should be directed to its removal. If, however, the case is one of purely neurotic origin, cold baths, fresh air, and plenty of outdoor exercise should be ordered. As an aid a few grains of sodium bromide may be given. The most unscientific treatment of cough in childhood is by means of opium preparations which are seldom, if ever, necessary.

BRONCHITIS.

Bronchitis, or inflammation of the bronchial mucous membrane, especially in its acute form, is a very common disease in the earlier years of life. Chronic bronchitis, on the other hand, is not very often met with in children.

Etiology.—While exposure to cold and wet act as potential etiological factors, there can be no doubt that bad feeding, bad ventilation, and over-coddling play a very essential part in the production of bronchitis in infancy as well as in childhood. Acute nasal or pharyngeal catarrh may lead on to catarrh of the bronchial mucous membrane, and, consequently, a seemingly slight cold in an infant should never be neglected. Certain infectious diseases are also responsible for many cases of acute bronchitis. Thus pertussis, measles, diphtheria, and enteric fever are often more or less associated with some degree of bronchitis. In rachitic infants well-marked bronchitis is frequently seen during the testing time of dentition, and some of these cases unfortunately succumb owing to their lack of

resisting power induced, it may be, by the upbringing of the child on some of the so-called infants' foods.

Symptoms.—There is a certain degree of cough without any expectoration, unless the patient is over five years of age. The respiration is rapid, and the temperature varies between 100° and 103° Fahr. The tongue is covered with a white fur, and the bowels may either be constipated or diarrhœa may be present. Infants very often have vomiting at the outset of the attack. If the smaller tubes are affected the temperature may run up to 104° or even 105° Fahr. There may be marked difficulty in breathing, with sucking in of the intercostal spaces and working of the alæ nasi during respiration. In older children the symptoms of bronchitis resemble closely those of the same disease as it is met with in adults.

Physical Signs.—On inspection we note the increased respiration rate with, it may be, indrawing of the intercostal spaces and dilatation of the alæ nasi. In bad cases we have cyanosis. On palpation rhonchi fremitus, or fremitus produced by moist râles, may be elicited. On percussion very little may be made out unless collapse of some portions of the lung has taken place, and then slight dulness may be obtained. Collapse of the lung, however, is very rarely seen in such cases. On auscultation the breathing is harsher than normal, and is accompanied by dry rhonchi and numerous moist râles. These sounds are often best heard over the back of the chest on both sides.

Prognosis.—In young infants, and even in older children, pneumonia may supervene and add to the gravity of the case. Apart from this, however, bronchitis may of itself prove a source of great danger, especially in fat and flabby children who have marked signs of rickets. A great

deal depends on the feeding and general management of the case. A well-treated case of bronchitis usually recovers, whereas a badly-treated one, though apparently milder at the start, may succumb. Age is also an important factor in prognosis, the younger the patient the more serious the condition as a rule.

Treatment.—The patient should be put to bed, and kept there. The temperature of the room must be maintained night and day at 65° to 70° Fahr. At the same time the air in the room, though warm, should be kept pure. If the child is vomiting, nothing but barley water or milk and aerated lime water should be given. A calomel purge is usually indicated. For a child of one year the following prescription will prove useful:—

℞ Hydrarg. Subchlor. . . . . gr. i.
Sacchar. Lactis . . . . . grs. iv.
Fiat Pulv.
Sig.—To be taken immediately.

Linseed and mustard poultices are usually ordered, but we prefer counter-irritation by means of eucalyptus oil diluted with olive oil if necessary. This should be well rubbed into the back and front of the chest, and a covering of absorbent cotton wool applied. Generally, at the outset some mild diaphoretic mixture may be given with advantage, such as the following:—

℞ Liq. Ammon. Acet. . . . . ℥iv.
Glycerini . . . . . ℥i.
Aquam ad . . . . . ℥iss.
Misce. Fiat Mist.
Sig.—℥i. tertia vel quarta hora ex aq.

The addition of vinum ipecacuanhæ is seldom advisable, save in the case of older children, who are able to

expectorate. Ammonium carbonate is apt to induce vomiting, and opium preparations are rarely to be thought of. At the same time a few drops of tinct. camph. co. will be found a useful addition to prescriptions in certain cases of bronchitis, more especially when the cough is very troublesome and keeping the little patient awake. The use of a steam-kettle to which has been added creosote or eucalyptus oil is often advantageous. The air of the room thus becomes charged with a stimulating antiseptic vapour which is inhaled, and so reaches the air passages. Cases which show signs of cardiac or respiratory failure demand very careful and prompt treatment. A hot mustard bath is very stimulating, so is a mixture of digitalis and strychnine. Alcohol in the form of good brandy or whisky is very helpful in such cases, but if it is to be of any practical service it must be given frequently and at regular intervals. During convalescence the diet should be very nutritious, and cod-liver oil or malt and oil should always be ordered. Attention should be given to the clothing of the child, and a change of air for some weeks may be enjoined if at all practicable. Care should be taken for the future, as children who have once had bronchitis are usually liable to repeated attacks on the slightest provocation.

PNEUMONIA.

There are two forms of pulmonary inflammation, viz. :— (1) *Lobar or Croupous Pneumonia*, and (2) *Lobular or Catarrhal* or *Broncho-Pneumonia*. These two forms are quite distinct, and a thorough knowledge of their special characteristics is incumbent on everyone who undertakes the treatment of disease in children, as both forms are very frequently met with in the young.

I. Lobar or Croupous Pneumonia.

Pathological Anatomy.—This form of lung inflammation shows four stages:—congestion, red hepatisation, grey hepatisation, and resolution. It is usually complicated by pleurisy, or by bronchitis of the larger tubes. The lung most commonly affected is the right, though the left or even both lungs may be involved. During the stage of congestion we find the air vesicles filled with exuded material. In the red hepatisation stage the affected portion of lung becomes perfectly solid, the air vesicles being filled with a fibrinous exudation, red blood corpuscles, leucocytes, and epithelial cells. Some maintain that grey hepatisation is only a post-mortem condition, and that consequently it does not really occur in cases which recover. Pericarditis and occasionally meningitis occur as complications; while abscess and even gangrene of the lung have been found post-mortem. In every case there is always a certain amount of pleural inflammation.

Etiology.—The age of the child is usually from three years and upwards, though the disease may occur at an earlier age. It is perhaps more commonly met with during the late autumn and early spring months. Although this disease may be brought on by exposure to cold and wet, the real cause is the invasion of the pulmonary tissue by the pneumococcus. It is usually met with in children who have previously been perfectly strong and robust, though we have known it to follow very shortly after an attack of pertussis.

Symptoms.—The onset is usually sudden and quite abrupt. The child is restless and irritable, with a positive distaste for food. Very often the attack commences with vomiting and diarrhœa, symptoms which are apt to mislead

the unwary, more especially when pain in the abdomen is complained of, as is not infrequently the case. The tongue is coated and thirst is well marked. The temperature is always high, never less than 104°, and often reaches 105·5° Fahr. The skin is characteristically hot and dry. The respirations are very rapid, often as many as 60 to the minute being counted. The pulse is out of proportion to the respirations, and may vary from 120 to 140 or more per minute. Pain is always more or less acutely felt. It

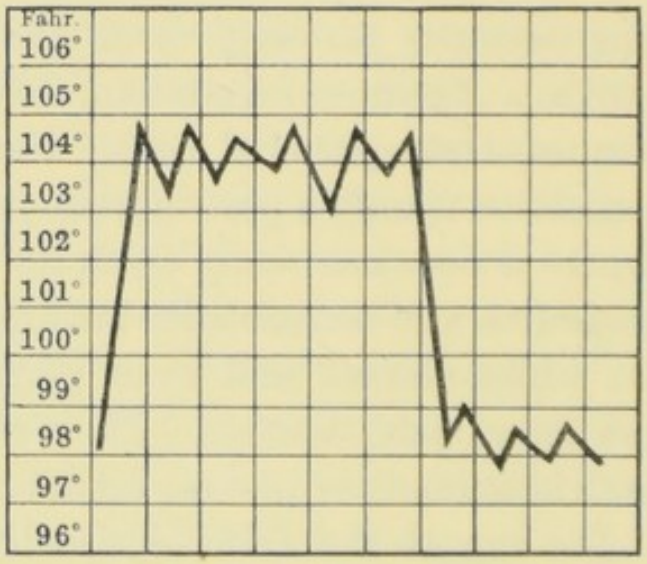


Fig. 1.—Temperature Chart in a case of Lobar Pneumonia.

may be marked over the affected side, but very often when asked where the pain is the patient points to the abdomen, the commonest sites being the iliac fossæ and the umbilical region. In such cases appendicitis or even peritonitis is apt to be diagnosed, and once or twice we have known such cases to be notified as enteric fever. In children we never get the characteristic rusty sputum so typical of the pneumonia of adults. The symptoms of vomiting and diarrhœa rapidly subside, but the pain is more persistent, though it rarely lasts beyond the third day. The disease terminates, as a rule, by crises on the

seventh or eighth day when the temperature and the pulse and respiration rates return to normal. The cough throughout this disease is very typical. It is short, frequent, dry, and very harassing. The patient is always markedly prostrated. In a few instances the onset of pneumonia is marked by a convulsive seizure, and if the temperature be taken during the fit it will usually be found to be over 105° Fahr. Occasionally we find herpes labialis present as in adults.

Physical Signs.—These are seldom well marked at first. All we have as a rule is very harsh vesicular breathing over the affected part of the lung. Later, however, we get typical signs of consolidation. Vocal fremitus is increased and the percussion note is dull. On auscultation we have bronchial breathing with increased vocal resonance. Friction sounds are usually present. During the resolution stage the dulness gradually clears up, and the breathing becomes normal once more. Throughout the process of resolution moist râles are usually abundant and easily heard.

Prognosis.—Death from uncomplicated lobar pneumonia is rare, and pulmonary tuberculosis is seldom found as a result of this form of lung inflammation. Exhaustion and cardiac failure are usually the forerunners of a fatal termination when such occurs. One of the commonest complications is empyema, and this should always be kept in view in cases which prove tardy in convalescing.

Treatment.—The patient must be kept in bed in a well-ventilated room. We have often seen oxygen used for the treatment of pneumonia, while at the same time the natural air in the apartment was saturated with CO_2. Feeding is of the utmost importance. Overloading of the stomach only embarrasses the heart which is already

sufficiently overtaxed. Too much starchy food is to be carefully avoided, as likely to produce flatulent distension of the stomach, which by pressing upwards on the heart may increase the patient's dyspnœa. A few grains of hydrarg. subchlor. should always be given at the start, and a simple mixture such as liq. ammon. acet. with pot. citr. Pain should not be relieved by heavy poultices, which only impede the respiratory movements of the chest. Personally we prefer a handkerchief wrung out of mustard and hot water as an application to the affected part. The temperature, unless over 105° Fahr., need not be reduced by antipyretics, and in any case tepid sponging is more satisfactory. This will likewise aid the induction of sleep should the child be wakeful and restless. Should heart failure threaten, a mixture of digitalis and strychnine will be found invaluable, as will also alcoholic stimulants. After the crisis careful nursing and feeding will greatly aid the child towards a rapid convalescence. Cod-liver oil with malt should be ordered, and where possible a change of air should be enjoined. During convalescence the chest should be frequently examined, and the risk of empyema must always be borne in mind.

II. Lobular or Catarrhal or Broncho-Pneumonia.

As this is perhaps one of the most important of all the chest affections of early childhood we shall devote considerable space to its consideration. It is a disease to which infants are more especially liable, and hence there is little wonder that it bulks so largely in our death returns.

Pathological Anatomy.—The epithelium lining the bronchi becomes very rapidly shed. The tubes become speedily filled with this desquamated epithelium together



PLATE II.—Broncho-Pneumonia in a Rachitic Female, æt. 3½ years recovering from Measles.

To face page 29

with mucous secretion. As time goes on and the disease advances the inflammation extends so as to involve the alveoli and the intervening connective tissue. The bronchioles become affected over a more or less extensive area as the process advances. In the course of time some of the alveoli are thrown out of respiratory action. No longer containing air these become collapsed, and we have a condition of atelectasis set up. At the post-mortem examination areas of emphysema are frequently observed, while acute miliary tuberculosis may be evident in some cases.

Etiology.—Age is a most important factor, and the patient is usually under five years of age, although after the age of three there is a very marked falling off in the number of cases. Lack of proper hygiene is a very powerful agent in the production of this disease. Children who are kept wrapt up in dirty, foul-smelling rags, who are never allowed to breathe fresh air, and who do not know what it is to be regularly bathed, are the type in which we most frequently meet with broncho-pneumonia. Such children are usually more or less rachitic, and this tendency to rickets is generally aggravated by improper feeding. Children of the class referred to if brought up on the breast are fed whenever they cry, and get a little of "whatever is going," or if bottle-fed they suck in all kinds of germs from a long rubber tube, the walls of which are laden with disease-producing organisms. The "baby's comforter," that iniquitous invention, is likewise a source of this as well as of many other children's diseases.

Of infectious fevers measles, diphtheria, and whooping-cough are especially liable to be complicated by broncho-pneumonia, and in many of these cases the latter com-

plication undoubtedly leads to a fatal termination of the disease. At the same time we must bear in mind that a fatal termination in measles and whooping-cough is more common in children who are rachitic than in those who develop broncho-pneumonia *per se*. Speaking generally the child is distinctly out of condition before the onset of the disease, thus forming a marked contrast to the child who develops lobar pneumonia, in which case the previous health is, as a rule, excellent. Our own observations do not show any tendency of the disease to be more prevalent at one season than another, although it is usually stated that broncho-pneumonia is much more prevalent in winter and spring than during the other seasons of the year.

The chief cause, when all has been said, is undoubtedly a micro-organism, but as yet no definite one has been assigned to this disease. The diplococcus of Fraenkel, the bacillus pneumoniæ of Friedlander, streptococci, staphylococci, and even the bacillus coli communis, have all been found in different cases.

Symptoms.—These are most important, and must receive very special consideration, as occasionally cases of this disease are overlooked from lack of knowledge as to the leading symptoms. When the disease is fully developed we have a fairly typical clinical picture presented to us. There is marked dyspnœa with a short, frequent, and painful cough, causing the child to cry when the paroxysm is over. The extraordinary muscles of respiration are brought into play, and there is always evident working of the alæ nasi. The pulse is very rapid (120 to 180 or more), and the temperature may register anything between 103° and 106° Fahr.[1] The temperature chart, of

[1] In one of our cases which recovered the temperature of the child when first seen at 10.30 p.m. was 107·5° Fahr.

which we subjoin an actual specimen, shows very distinct intermittency throughout.

There is usually some indrawing of the intercostal spaces during respiration. The child, unless much prostrated by the disease, is generally cross and irritable, and exhibits considerable peevishness. Thirst is often intense, an important point to bear in mind with reference to treatment. The tongue is sometimes coated, at other times red and raw-looking. The bowels may be con-

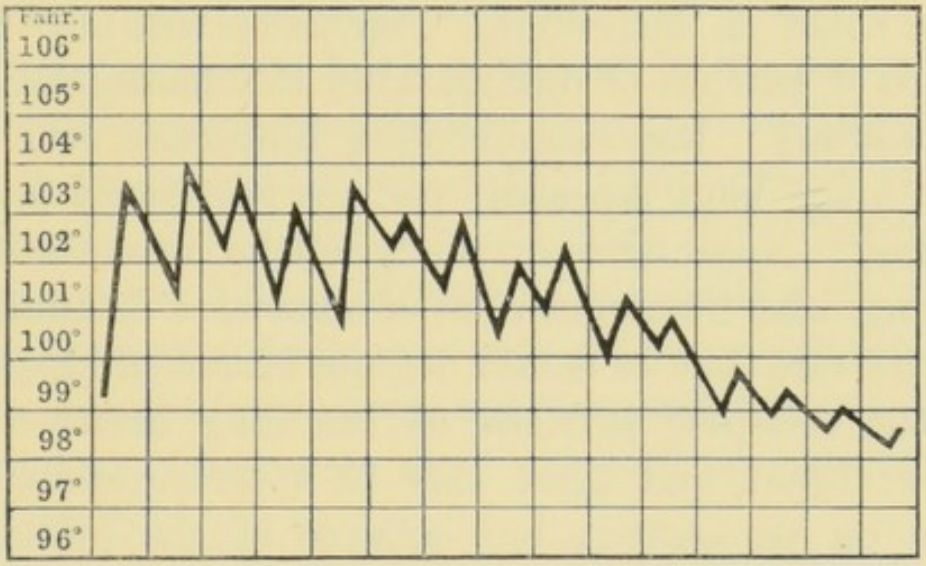


Fig. 2.—Temperature Chart in a case of Broncho-Pneumonia, ending in recovery.

stipated, but more commonly diarrhœa is present, and this may constitute a somewhat grave symptom especially if associated, as it sometimes is, with much vomiting.

In some cases we find symptoms of simple bronchitis preceding those detailed above for a variable period, but sooner or later these become altered in character in the manner already indicated. When pulmonary collapse supervenes the temperature usually falls, while the dyspnœa becomes aggravated. In cases which recover the temperature falls by lysis, and the symptoms gradually

improve, the cough and dyspnœa especially becoming less marked. Convalescence is always a tardy process, and is often impeded by the onset of one or other of a number of complications. Thus tubercular infection of the diseased pulmonary area is not at all uncommon, and in some instances the original disease may remain in a somewhat subacute or chronic state for a considerable time.

Physical Signs.—These are not nearly so helpful in diagnosis as the symptoms. In the early stage the indrawing of the interspaces and the working of the alæ nasi may be noted on inspection. Percussion will only afford evidence of patches of dulness after the disease has made some headway. Resonance is often diminished over parts of both lungs, more especially perhaps posteriorly towards the bases. Auscultation usually elicits weak or feeble breathing, with numerous râles of somewhat medium size. It is very rare that we obtain definite bronchial breathing. Over the collapsed portions of the lung breath-sounds may be absent, and there may be a certain amount of dulness on percussion; but collapse of the pulmonary tissue is not always really made out on examination of the chest, and its presence is more often suspected from the symptoms present.

Prognosis.—This is a very fatal disease. It is not infrequently the mode by which a case of measles or of whooping-cough terminates. The prognosis is largely influenced by the following factors:—

1. *The Cause.*—Broncho-pneumonia is specially fatal in children who are rachitic or tubercular.

2. *The Age.*—It is more serious in infancy than at a later period. This is well seen when it occurs during the course of dentition, as it then most commonly has a fatal termination.

3. *The Treatment.*—By guarding against collapse, and carefully treating symptoms as they arise, much may be done to bring the case to a successful issue.

Treatment.—The prophylactic treatment of broncho-pneumonia is of the utmost importance. Much may be done in the management of cases of simple bronchitis, or of measles and of whooping-cough, to ward off this disease. By judicious management broncho-pneumonia may often be prevented altogether. The chest should always be carefully examined in the diseases named, and any change in the cough or in the respiration rate duly noted.

When the disease has actually set in the patient must be treated on somewhat similar lines to those already laid down for lobar pneumonia. The treatment of broncho-pneumonia is, however, a much more important matter, because, whereas lobar pneumonia is usually a self-limited disease, broncho-pneumonia very often runs a protracted course, and unfortunately not uncommonly has a fatal termination. Hence we must consider the treatment in some detail.

As soon as the patient shows symptoms of pulmonary invasion he should be placed in a crib or bed in a large airy room. To confine a child suffering from broncho-pneumonia in a cradle surrounded by curtains is positively dangerous, and such a procedure usually brings about an unfavourable result. The room must not be overheated, nor is it advisable to employ a steam kettle, as the use of the latter frequently leads to the child perspiring very freely, and this of itself still further weakens the patient. The steam from the kettle, moreover, may actually impede the respiration. The air in the room should be kept constantly changed, without, of course, exposing the child to draughts or to actual currents of cold air. At the outset

it is well to give a grain or two of hydrarg. subchlor., which may with advantage be repeated occasionally during the course of the disease. Expectorants are worse than useless, and nothing beyond a few drops of liq. ammon. acet. should be prescribed in ordinary cases. Feeding is of the greatest importance, as we have already pointed out when speaking of lobar pneumonia. Too much milk and too much starchy food must be carefully avoided. We believe greatly in whey and malted foods when the child is not at the breast. In Hovis food we now possess a very nourishing material, which we have found serviceable in not a few cases. When the child is vomiting we give nothing but barley water and whey, and occasionally a small teaspoonful of beef jelly which has previously been kept on ice. The child should be fed at regular intervals with small amounts of nourishment, and from time to time the physician should percuss the abdomen to make sure that there is no flatulent distension of the gastro-intestinal tract.

As a rule every case of broncho-pneumonia requires to be stimulated. The liability to pulmonary collapse may thus, to a great extent, be avoided. Perhaps the most generally useful stimulant is good brandy six or seven times diluted. As much as four ounces of brandy may be given to a child of two or three years in the course of twenty-four hours; but probably from one-half to one-and-a-half ounces will be found sufficient in ordinary cases. It is well to remember, however, that many an infant life may be saved by pushing the brandy, whereas with smaller doses the patient may succumb. Whisky may also be employed, but it is not quite so useful or reliable. Next to brandy we would place digitalis and strychnine. In bad cases a combination of these will be

found to yield the best results. We would here warn the reader against using too small doses of digitalis. To a child of one year of age we should give one minim of the tincture every hour or two, and to a child of four we should not hesitate to place the dose at four or five minims, always watching very carefully the result of its administration. Small doses of digitalis are, we maintain, absolutely useless either in the case of adults or of children. Strychnine is the great stand-by in bad cases. Not only does strychnine stimulate the heart, but it also energises the respiratory centres. Half-a-minim may be given every two hours to an infant of one year for a few doses, and to a child of four or five years a minim may be given every hour for several doses where the case is really urgent and the symptoms grave. For hypodermic injection caffeine is strongly advised by many writers, and certainly in some cases in which we have tried it we have obtained very satisfactory results, not at all comparable, however, with those produced by the administration of digitalis combined with liq. strychniæ.

Such is an outline of the ordinary treatment, but we must do more in cases which show signs of pulmonary collapse. Here the child should be encouraged to cry. The application of a cold sponge to the chest will often have the desired effect. Counter-irritation of the chest will also aid in preventing the process from spreading. Poultices must never be used; but inunctions of equal parts of eucalyptus and olive oils will be found very efficacious. Where heart and respiratory failure threaten we have often succeeded in pulling the patient round by plunging him into a hot mustard bath. Of cold baths we have had little experience, but we should certainly be chary in recommending them in every case; and they ought cer-

tainly never to be used when the temperature is low, and the hands and feet cold and clammy. If the temperature is high, and the child in a state of cyanosis and stupor, then a cold bath or a wet pack will act well.

It is advisable to see that the child never lies too long in one position. He should be lifted up by the nurse from time to time, and held in her arms. This will prevent congestion and collapse of the lungs. If the child is at all restless and sleepless, tepid sponging of the face and chest will often act as a sedative.

During convalescence cod-liver oil or malt and cod-liver oil is indicated. Iron in some form or other will also prove helpful in correcting the resulting anæmia. A trip to the sea-coast in summer or the south of England in winter and spring will prove very advantageous. The after-treatment of the case demands the greatest possible care, as many of these patients develop pulmonary tuberculosis owing to defective management during the period of convalescence. As in lobar pneumonia so here the chest should be thoroughly examined from time to time during this period.

To sum up: fresh air, attention to the gastro-intestinal tract, and judicious stimulation are of infinitely more value than expectorants or emetics or any depressant form of treatment.

PULMONARY TUBERCULOSIS.

Pulmonary tuberculosis as it occurs in infancy and childhood is a somewhat difficult subject to master. As it is usually presented to us in text-books it is a disease which assumes a variety of forms in both the clinical and pathological aspects. In a small work such as this it is, of course, impossible to attempt more than to give a brief

outline of the subject. We have for the sake of greater clearness and simplicity of description adopted a classification which differs in some respects from that usually given by writers on this disease.

Pulmonary tuberculosis may be either *Primary* or *Secondary*, and in both cases it usually assumes the form of a broncho-pneumonia. The following table will considerably simplify matters:—

A. *Primary Pulmonary Tuberculosis* may be { (a) *acute.* (b) *chronic.*

B. *Secondary Pulmonary Tuberculosis* may be { (a) *acute.* (b) *chronic.*

Secondary Pulmonary Tuberculosis may be the result of—

1. *Simple Broncho-pneumonia*, especially where this has followed on measles or on whooping-cough.

2. *Tubercular infection of other organs and tissues*, such as the intestines, meninges, etc.

3. *Acute Miliary Tuberculosis.*

4. *Tonsillar and Bronchial Gland infection.*

We need not pause to consider the pathological anatomy of this disease, as it differs in no great degree from that presented to us in adult life. The lesion most commonly met with is a broncho-pneumonia, and the bronchial glands are almost invariably markedly affected. Nor does the clinical picture presented to us in the primary cases differ from that seen in the secondary cases of the disease. We shall, therefore, at once proceed to give a brief account of the symptoms and physical signs.

Symptoms and Physical Signs.

(*a*) *Acute Pulmonary Tuberculosis.*

This is a very fatal form of the disease. The chief

symptoms are cough and marked weakness. The cough is very distressing. The breathing is rapid and shallow. The temperature resembles somewhat that of an ordinary broncho-pneumonia. The pulse is always rapid and feeble, and cerebral symptoms may develop in some cases.

The physical signs are rarely characteristic. We usually have harsh vesicular breathing with rhonchi and numerous fine crepitations, while areas of slight dulness may be obtained on careful percussion of the chest, especially over the upper lobes anteriorly.

(*b*) *Chronic Pulmonary Tuberculosis.*

This is by far the most common form of the disease as met with in infants and children. By "chronic" we mean those cases which drag on for a few weeks or even months. The onset is usually insidious, and so the disease is often overlooked even by those experienced in the management of children. Perhaps the two earliest symptoms are cough and emaciation. The child ceases to take any interest in his surroundings, and loses his appetite. It is noticed that he has a nasty, harassing cough, often worse at night. Then the breathing becomes accelerated, and the pulse is found to be rapid and feeble. The temperature shows a varying curve, hardly ever giving the same record on two successive occasions. Pain in the chest may or may not (usually not) be present. In most cases there is more or less gastro-intestinal disturbance, vomiting and diarrhœa being extremely common.

Hæmoptysis may be the first indication of the existence of pulmonary lesion, but this is very rare, though we have seen it in more than one case. Sweating is not so marked a feature of the disease as it is in adults. On the whole the emaciation, which is always well marked, is one of the

most characteristic and distinguishing points, as is also the pallor of the face, which is often very striking and suggestive.

The *physical signs* are those of broncho-pneumonia, and in the more chronic cases the evidence of cavities may become superadded. Beyond the fact that the signs are usually best and earliest obtained over the central portions of the lungs, these differ in no respect from those obtained in similar conditions in adults.

Prognosis.—This may be briefly summed up by saying that the younger the child the graver the prognosis. Nothing can arrest the disease when it attacks infants, and little can be expected from treatment even in young children. Should the disease be checked for a time we can never say that the little patient is absolutely cured.

Treatment.—From what has been said under the heading of prognosis it will be evident that prophylaxis forms the principal part of the treatment. Infants and children of tuberculous parentage should not sleep in the same bed or even in the same room as their father and mother. Tuberculous women ought never to nurse their offspring. All milk should be rendered tubercle-free before being given to children. Care should be exercised during convalescence from infectious fevers and all weakening diseases such as pneumonia. Adenoids and enlarged tonsils should be seen to, as not only do these impede the development of the chest, but it may be that sometimes they are actually the seat of tuberculous infection.

In the treatment of the actual disease three things must be given the first place, viz.—fresh air, good food, and cod-liver oil. It is of no use whatever to send such children into crowded hospitals. To do so means to court death. The child must have fresh air to breathe, and this

he can never obtain in a ward, no matter how well ventilated that may be. He should be placed out-of-doors for several hours each day. The diet should be chiefly milk, cream, eggs, and raw meat-juice given at frequent intervals. Cod-liver oil is invaluable, and there is no substitute for it. Cream will never give the same therapeutic results, and it is quite erroneous to suppose that, if a child cannot take cod-liver oil, cream will do equally well. Petroleum emulsion, so often brought forward as a substitute for cod-liver oil, is useless. It is a mineral oil, and is not absorbed; and, consequently, no benefit can be derived by the lung from its antiseptic properties. In giving cod-liver oil the mistake is usually made of ordering too large quantities. For infants 10 drops two or three times a day is quite sufficient, while for older children ½ to 1 tea-spoonful will be found the most suitable quantity. If too much is given the stomach is apt to be upset, and the appetite for food destroyed. As a local application to the chest, eucalyptus oil or an ointment containing ichthyol and lanoline may be employed. The symptoms of cough and cardiac debility are best treated by attention to general hygiene, but in some cases small doses of tr. camph. co. with tr. digitalis will be found helpful.

PLEURISY.

Pleurisy, or, as it is probably more accurately termed, Pleuritis, occurs in three forms, viz.—(1) Dry Pleurisy, (2) Pleurisy with serous effusion, (3) Pleurisy with purulent effusion, *i.e.* Empyema. We shall now consider each of these varieties in order.

1. Simple Dry Pleurisy.

Etiology.—The existence of idiopathic pleurisy is now

very much questioned, and certainly the majority of cases are secondary. Thus it is known to accompany pneumonia and pulmonary tuberculosis, and we have frequently observed its occurrence in rheumatic children. There can be little doubt that many of the catching pains in the chest, of which children frequently complain, are in reality mild pleuritic attacks. It is rarely if ever met with in infants and very young children, but after the age of eight or nine years it becomes fairly frequent.

Symptoms and Physical Signs.—There is practically one symptom and one physical sign present, namely, cough which is short and painful in character, and friction which is audible during both inspiration and expiration. It is easily diagnosed, and can only be mistaken for muscular rheumatism; but in pleurisy we usually have slight rise of temperature.

Treatment.—The patient must be kept warm in bed. Locally mustard poultices are to be applied, and internally a mild diaphoretic mixture given. If the cough is very troublesome and painful a few minims of tr. camph. co. will be found soothing. The bowels should be kept open by pulv. glycyrrhiz. co., or a few grains of hydrarg. subchlor. may be administered. If the case is a rheumatic one, aspirin in 5 to 10 grain doses every six hours forms a useful adjunct to treatment.

2. Pleurisy with Serous Effusion.

Bacteriological Note.—Koplik has given us a very complete account of his investigations on the subject of the bacteriology of pleuritic effusions as met with in children. The fluid may be sterile or contain organisms, of which the following are most frequently met with:—

(1) pneumococcus, (2) staphylococcus p. aureus, (3) streptococcus, (4) bacillus tuberculosis, which however is very seldom found.

Etiology.—Pleurisy with serous effusion may follow on pneumonia, or may form a complication of nephritis, acute rheumatism or certain of the exanthemata, notably scarlet fever, and it may be tubercular in origin in certain cases.

Symptoms.—Very frequently there are no special symptoms present beyond general weakness and languor. Pain may or may not be present, and is certainly never so well marked in children as in adults, moreover the pain is sometimes misleading as it is often referred to the abdomen rather than the chest. The pulse is usually somewhat rapid, but respiration is often unembarrassed, though on closer observation the rate is seen to be more or less increased. The temperature is seldom high, though in one or two cases, which were undoubtedly tubercular, we have noted temperatures of 102·8° and 103·5° Fahr. In addition to the symptoms already mentioned we have pallor and loss of appetite.

Physical Signs.—These are fully detailed in the diagnostic table given below, but we may briefly refer to them here. On inspection we have increased respiration rate attended by diminished thoracic movement. The affected side bulges. On palpation we find absence of vocal fremitus. Percussion gives us a characteristically dull note with a sense of resistance. Auscultation is very important, as not infrequently in children the signs thereby obtained differ from those got in adults suffering from a similar condition. In children bronchial or perhaps indeterminate breathing is usually heard, and the vocal resonance is often found to be increased. The presence of râles is not by any means uncommon, especially when

the fluid is undergoing absorption, and friction sounds are also sometimes well heard.

The difficulty in diagnosis lies between *pneumonia* and *pleurisy with effusion*. We have, therefore, thought it advisable to furnish a table giving side by side the differences in the physical signs of the two diseases.

	PNEUMONIA.	PLEURISY WITH EFFUSION.
Inspection.	Breathing is rapid, but not particularly shallow.	Breathing is often rapid, but is always more or less shallow. The affected side often bulges.
Palpation.	Vocal fremitus increased. No displacement of apex beat.	Vocal fremitus absent. Apex beat frequently displaced.
Percussion.	Dulness, but not quite absolute.	Absolute dulness with a distinct sense of resistance.
Auscultation.	Breathing is always bronchial with the presence of râles, and vocal resonance is increased.	Breathing is usually bronchial, and there may be râles and friction sounds. The vocal resonance is often increased, though it may be diminished or even absent.

Other helpful diagnostic points are the lower temperature in pleurisy with effusion, and the absence of displacement of organs in pneumonia. Again the cough in pleurisy is usually dry, whereas that of pneumonia tends in time to become loose. The pulse-respiration ratio is more apt to be disturbed in pneumonia than in pleurisy with effusion, while flushing of the face would suggest the former disease rather than the latter, in which the aspect is usually one of pallor.

If doubt still exists in the practitioner's mind as to whether the case is one of pneumonia or pleuritic effusion, he should lose no time in making a diagnostic puncture.

Treatment.—Cases of pleurisy with serous effusion in children usually do well, though convalescence is apt to be somewhat tardy. We have found great benefit follow the use of small doses of hydrarg. subchlor., the fluid rapidly disappearing under this simple form of treatment. We can also speak favourably of syr. ferri iodidi, which we often give simultaneously with the mercurial salt. Attention should always be paid to the heart and pulse, and if the latter become very rapid and feeble no time should be lost in aspirating. It is rarely necessary to remove more than a few ounces. During convalescence cod-liver oil, iron, and quinine may be ordered, and the patient should have as generous a diet as possible. A holiday spent by the seaside usually materially hastens complete recovery in such cases.

3. Pleurisy with Purulent Effusion.

This condition is much more frequent in children than in adults. It is, in fact, one of those diseases which the physician must constantly bear in mind as it is often overlooked, and the case treated as if the condition were something different altogether.

Bacteriological Note.—All authorities seem to agree in placing the pneumococcus first in the order of frequency on the list of organisms found in the aspirated fluid. The tubercle bacillus, on the other hand, is comparatively rare. Streptococci and staphylococci have also been found, and in a small percentage of cases both the pneumococcus and streptococcus are present in the purulent fluid.

Etiology.—By far the most frequent cause of empyema

is broncho-pneumonia. Next in order we might place scarlatina, measles, and diphtheria, and lastly peritoneal conditions. Other causes are much rarer, and need hardly be mentioned in a work such as this.

Symptoms.—It is well, perhaps, to emphasise the fact that this disease often comes on quite insidiously. Indeed it is frequently latent, and consequently not uncommonly overlooked by the general practitioner. As a rule it complicates pneumonia, and when we meet with it in association with this disease the only symptoms present may be a slight rise of temperature, with some cough and shortness of breath, which might likely enough be credited to the pneumonic process going on in the chest. After a time the child becomes pale and emaciated, and the temperature tends to keep above 100°, though we have seen more than one case of well-marked empyema in which the axillary temperature never rose more than a degree above the normal. Occasionally there is diarrhœa.

In a certain percentage of cases the disease comes on acutely with marked febrile symptoms, irritating cough, and increasing dyspnœa. As time goes on we have an uneven temperature curve in association with a rapid pulse and hurried, restricted breathing. Such cases are apt to be mistaken for pneumonia.

Physical Signs.—These are similar to those met with in pleurisy with effusion already mentioned (*vide* p. 42). The diagnosis between purulent and serous effusion can only be made by means of an aspirating needle. Those who diagnose empyema by other means must have some special diagnostic power, as the average clinician certainly cannot accomplish this feat. The needle should be inserted into the fifth interspace. It is always well to remember that the amount of fluid may be small, and by using too long a

needle it may be missed altogether. Repeated punctures may be necessary, and if we are doubtful as to the presence of fluid we must not rest until we have made absolutely certain of its presence or absence.

The diagnosis between empyema and an unresolved pneumonia is apparent from the subjoined table:—

	EMPYEMA.	UNRESOLVED PNEUMONIA.
Inspection.	May have bulging on affected side.	No bulging on affected side.
Palpation.	Heart may be displaced.	Heart in normal position.
Percussion.	Greater area of dulness with sense of resistance.	Area of dulness more localised.
Auscultation.	No moist râles.	Moist râles often abundant.

Examination of the blood may be useful in clearing up the diagnosis, but exploratory puncture is the most reliable means.

Treatment.—This is a purely surgical matter. In every case the best and safest form of treatment is by free incision and drainage. Care must be taken during the administration of the anæsthetic, and the patient's breathing should be carefully watched when he is turned over on to his side. So dangerous is general anæsthesia in these cases that many advise the use of a local anæsthetic, but we fear this is not practicable in the majority of cases. The incision is made over the seventh or eighth rib in the post-scapular line. The periosteum is separated from the bone, and the rib is then divided. The pleura is next incised, the pus evacuated, and the

cavity wiped out. A gauze drain is finally inserted, and the wound dressed in the ordinary way. This operation is always successful if the case is diagnosed early; and it certainly gives better and more speedily apparent results than aspiration which, after all, is merely palliative.

ASTHMA.

Typical cases of this condition are rarely met with in children. It is certainly true that we meet with infants and young children who suffer from periodic attacks of cough and spasmodic dyspnœa, but these are usually due to rickets, and are in no sense cases of genuine asthma.

Etiology.—It may be hereditary, but otherwise we meet with it after whooping-cough, and in association with recurring bronchitis and severe eczema. Adenoids and enlarged tonsils are often present in children suffering from asthma, and persistence of the thymus gland is given as a cause in one recorded case. Its relation to hay fever is interesting, but this relationship is rarely met with in young children.

Symptoms.—In certain cases we meet with attacks of asthma complicating bronchitis; and then we find that the dyspnœa is greatly exaggerated. The attack usually comes on during the night, and the child sits up in bed, gasping for breath, its face and lips being markedly cyanosed. In other cases the attack comes on in the midst of seemingly perfect health. There is great dyspnœa with dry, short cough, but no interference with temperature, though the pulse may be very rapid and feeble.

Physical Signs.—On inspection the thorax is seen to be fixed at full inspiration, and the diaphragm depressed.

The shoulders are often rounded, and the face has a peculiarly blue aspect, the lips and alæ nasi being very prominent and much thickened. On percussion the chest is found to be hyperresonant throughout. Auscultation reveals very feeble breathing with numerous rhonchi and moist râles.

Treatment.—Fresh air, good and easily digested food, with a small amount of cod-liver oil, are very essential. Adenoids and enlarged tonsils call for removal. Arsenic and syrup. ferri iodidi give good results in most cases. During the attack phenazonum or chloral hydrate are to be recommended. A change of climate may be necessary, but as a general rule the asthma of childhood is more frequently recovered from under proper treatment than the somewhat similar disease of adults.

CHAPTER V.

DISEASES OF THE CIRCULATORY SYSTEM.

CONGENITAL AFFECTIONS OF THE HEART.

CONDITIONS such as Acardia and Dextrocardia need not be referred to in detail here. We shall, for the sake of brevity, only deal in this section with those congenital heart affections which are of real clinical importance. If we attempt to give a short list of these conditions, it must be clearly understood that it is by no means a complete one, only the more important being mentioned :—

1. Patent Foramen Ovale.
2. Defective Interventricular Septum.
3. Defective Pulmonary and Aortic Valves.
4. Defective Tricuspid and Mitral Valves.
5. Stenosis of the Pulmonary Orifice.
6. Patent Ductus Arteriosus.

Though any one of these conditions may exist alone, it is much more common to find it in association with one or more of the others. The effect of fœtal endocarditis in the production of congenital heart disease must never be forgotten or overlooked. Although it is frequently stated that fœtal endocarditis more commonly attacks the right side of the heart, there seems to be no very good reason for placing over-much credence in this belief.

Patent foramen ovale is comparatively common. It may be present alone, or may be combined with other lesions. It is important to bear in mind that by an unwritten pathological law defective cardiac valves are extremely liable to undergo thickening and sclerosis, and so where the pulmonary or aortic or the tricuspid or mitral valves are maldeveloped they not infrequently become the seat of chronic inflammatory thickening. Fœtal endocarditis is said to be responsible for cases of *stenosis of the pulmonary orifice,* which is one of the most frequently met with of all cardiac defects. *Patency of the ductus arteriosus* may not lead to serious results unless, as is often the case, it is complicated by other abnormal conditions.

We are now in a position to consider the

Symptoms and Physical Signs of Congenital Heart Affections.

Two *symptoms* stand out in bold relief, viz. (i.) Cyanosis, and (ii.) Clubbing of the Fingers and Toes. The cyanosis is very characteristic, and taken alone is almost completely diagnostic. It occurs during the first few days of the child's existence, and persists more or less throughout its whole life. The extremities are not only blue, but they are cold and numb. There can be little doubt that the cyanosis is largely the result of imperfect aeration of the blood in the lungs. Clubbing of the fingers resembles that seen in chronic pulmonary disease in adults. These children are usually spare and small of stature. They are specially liable to attacks of bronchitis, and if they live long enough they will usually suffer from chronic cough and fitful attacks of dyspnœa.

The *physical signs* will not always indicate the exact nature of the lesion. The heart may be found enlarged,

more particularly to the right; but if we are not mistaken, this fact is not of much importance from a diagnostic point of view, as we have time after time percussed out the hearts of healthy children and found them extend for a considerable distance to the right of the sternum. Of much greater importance is the presence over the base

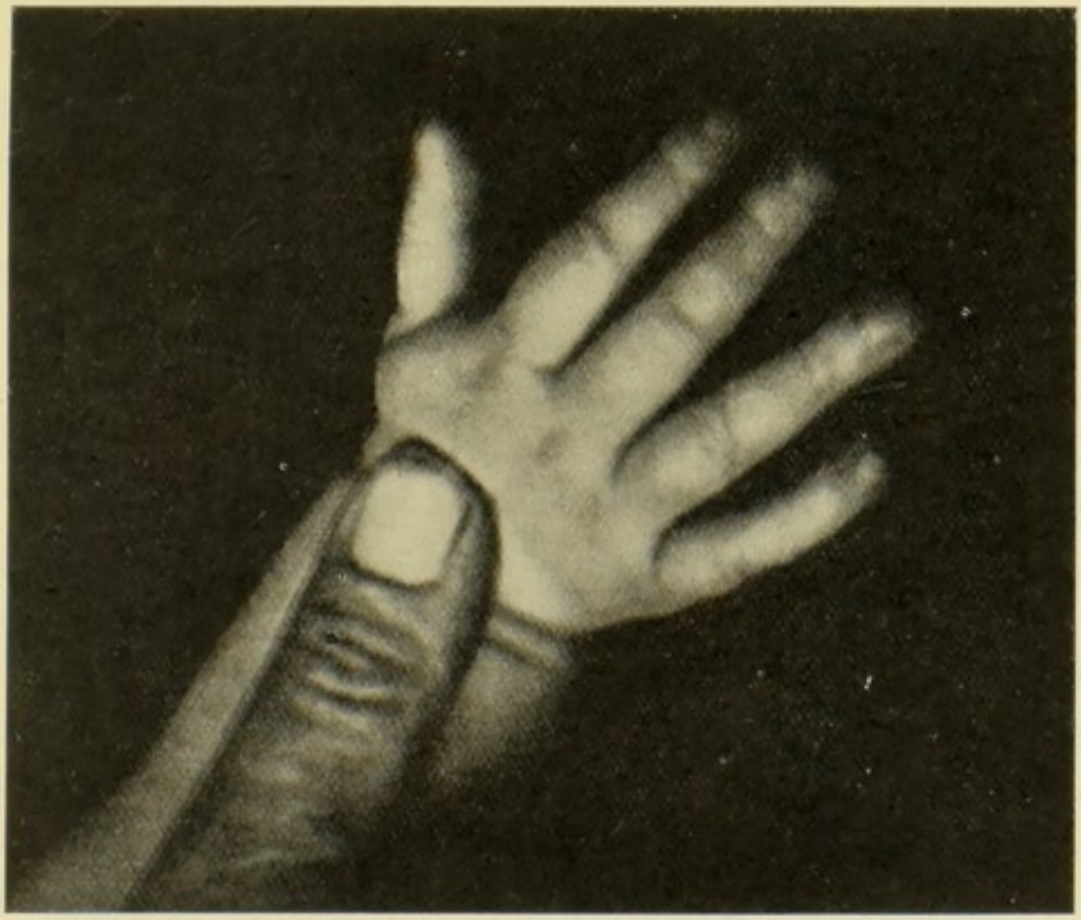


FIG. 3.—Hand from a case of Congenital Heart Affection showing clubbing of the Fingers.

of the heart of a systolic murmur which is accompanied by a distinct thrill. These signs are of special interest when associated with a small, irregular pulse, palpitation and pain over the præcordia, as then they may indicate stenosis of the pulmonary orifice.

The attempt made to diagnose the actual nature of the lesion is often unsuccessful, and we have more than once

seen eminent clinicians come to grief over such cases. One case in particular we call to mind where the diagnosis was not confirmed at the post-mortem. The following notes of the case may be of some value :—C. A., female, æt. 18, but looks much younger. Complains of pain over the præcordia and chest, shortness of breath and slight cough, giddiness, and swelling of the ankles and legs. The lips cyanosed. Pulse regular. Pulsation of vessels in neck and over præcordia. Systolic murmur at apex. Systolic and diastolic murmur over second left interspace with marked pulsation. Apex beat displaced downwards and outwards for nearly 1½ inch. This case was diagnosed as one of patent ductus arteriosus, but we were not at all convinced from personal examination of the heart that this was so. On post-mortem examination nothing was found save a simple dilatation of the pulmonary orifice.

Prognosis.—This is stated by most observers to be grave. Still such cases are not always hopeless. Many persons with congenital heart disease live to a good age. This is especially true of cases where the pulmonary orifice is affected. We have had two cases under observation, the one for six, and the other for nearly five years, in which there is undoubted congenital disease of the heart. There is in both cases a well-marked basic systolic murmur, accompanied in the second case by very distinct cyanosis and marked enlargement of the lips. Our diagnosis is at present pulmonary stenosis. Both patients are over twenty-five years of age, and though they suffer from dyspnœa on exertion they are both able to take part in the ordinary business of life.

Treatment.—Much may be done for such patients by careful regulation of the life. They must not be sent to school too early, and they must never be overtaxed with

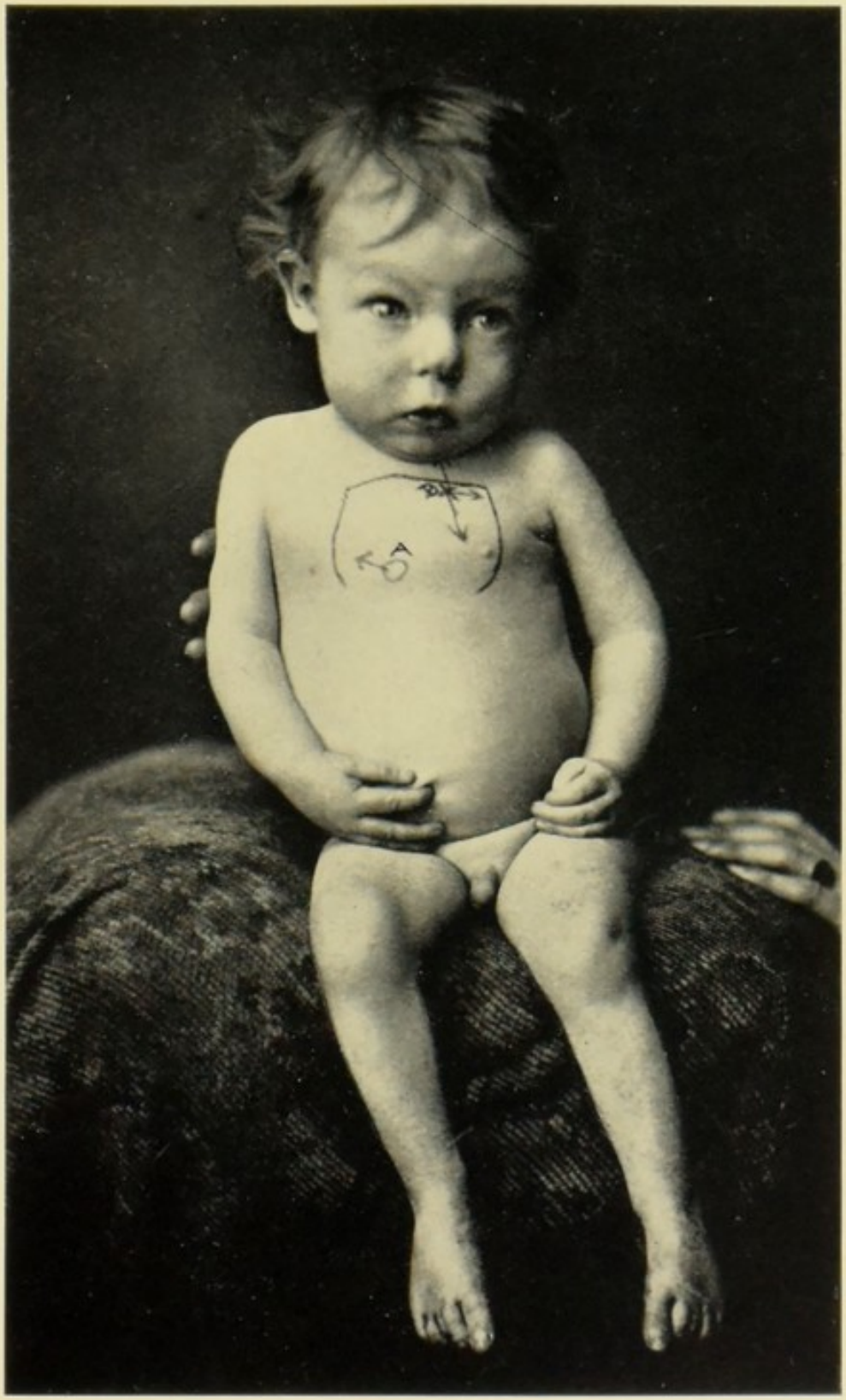


PLATE III.—Rachitic Infant, æt. 18 months, suffering from Congenital Heart Disease. The outline of the cardiac dulness is shown, and the propagation of murmurs from the areas A and B. Note also the cyanosed face and lips.

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study or work of any kind. A quiet, uneventful life will suit them best; and gentle, open air exercise should be engaged in. Care must be taken against the risks of bronchial catarrh, and the gastro-intestinal tract should receive constant attention. For the dyspnœa brandy or aromatic spirit of ammonia is indicated. Should the heart threaten to fail strophanthus and strychnine may be ordered. More important than drugs, however, is the general conduct of the patient's life.

PERICARDITIS.

This disease is stated by Rotch to be "less common the younger the subject." Still it may occur during infancy, though it certainly becomes much more frequent after the fourth year.

Etiology.—The causes of pericarditis are varied, and may be summarised as follows:—

1. *The Exanthemata*, especially scarlatina. In this disease it usually occurs coincidently with nephritis.

2. *Acute Rheumatism.*—Pericarditis may be the only rheumatic manifestation present in a child, a fact which should never be lost sight of.

3. *Pneumonia.*—This is not by any means an infrequent cause.

4. *Various Diseases*, particularly pulmonary tuberculosis, pyæmia, and mediastinal inflammation.

It is noteworthy that in children pericarditis with more or less effusion is the rule.

Symptoms.—The diagnosis of pericarditis at the start is not always an easy matter in the case of adults; the difficulty is a hundredfold greater in the case of children. Pain may be complained of, but this may be referred to

the head or to the abdomen, or, as we remember in one case, to the left shoulder. There is always rapidity of the pulse, but this is by no means pathognomonic. Dyspnœa, frequently associated with harassing cough, usually presents itself, but this too may not be at all suggestive of pericarditis. Slight cases are the ones which present most trouble to the physician; but where the effusion is large the diagnosis becomes somewhat less difficult, for then the dyspnœa becomes well marked, while the heart is seen to beat violently and unsteadily.

Physical Signs.—On inspection we note præcordial bulging and increase of the normal cardiac area. Palpation will reveal an unsteady and somewhat violent apex beat. On percussion the cardiac outline will be increased in extent, and it may be taken as proof of the existence of fluid when absolute dulness is obtained in the fifth right interspace. Auscultation may or may not yield friction at the base of the heart, but when present it is diagnostic of pericarditis.

Prognosis.—Pericarditis is almost always fatal when it occurs in infancy or early childhood. In older children it still continues to be a serious disease, but may be recovered from, though it has a strong tendency to recur or remain somewhat chronic.

Treatment.—The treatment of pericarditis in children is a subject about which much might be written. The child, if not already in bed, must be placed there, and kept at absolute rest in the recumbent position if the breathing permit. If the case is a rheumatic one the indication is to give aspirin or salicylate of soda. A small dose of hydrarg. subchlor. is also useful at the start. For the pain we prefer frequently repeated doses of opium or of syr. codein., but if these are given we must first make

sure no kidney mischief is present. Locally mustard or lin. iodi is to be preferred to blisters in very young children, but in older subjects these may be employed with care. Heart failure is very apt to set in rapidly in these cases, and when this threatens stimulation is absolutely necessary. For this purpose digitalis and strychnine may be given alternately with brandy or aromatic spirit of ammonia. In some cases the application of an icebag over the præcordia is to be preferred to all else; but this is best suited for use in the case of older children.

MYOCARDITIS.

Most writers seem to regard myocarditis as a somewhat rare affection in children, but judging from the nature of the causes which give rise to it we consider that it is of sufficient interest and importance to have a special section devoted to its consideration.

Myocarditis may be classified as follows:—

I. *Interstitial, i.e.* involving the connective tissue between the muscle bundles. This may be either *Acute* or *Chronic.*

II. *Parenchymatous, i.e.* involving the muscle fibres themselves. This is an *acute* process.

Etiology.—Acute Interstitial Myocarditis may be caused by *rheumatism,* in which case the inflammation extends from the endo- or peri-cardium to the muscular substance of the heart. It is also met with in *scarlet fever,* more especially where this is complicated by acute nephritis. *Traumatism* as a cause of myocarditis is rare.

Chronic Interstitial Myocarditis is much less common, and when it does occur it is almost invariably due to

rheumatism, though *congenital syphilis* may possibly give rise to it in some cases.

Acute Parenchymatous Myocarditis may be produced by *acute rheumatism, diphtheria, scarlet fever*, and other febrile diseases incident to childhood. There can be little doubt that not a few of the cases of cardiac dilatation and failure met with in acute rheumatism, scarlet fever, and diphtheria are in reality attributable to an acute affection of the cardiac musculature.

Symptoms.—These are necessarily somewhat indefinite. They are principally those associated with heart failure, such as dyspnœa, a rapid and faltering pulse, with pallor of the face and extremities. In chronic cases we may have all the backward pressure phenomena which are met with in cases of chronic endocarditis.

Physical Signs.—On inspection there will be observed a feeble and somewhat diffused apex beat, or it may be so weak as to be absolutely imperceptible. Palpation will confirm this observation. The cardiac dulness will probably be increased in extent, while on auscultation the heart sounds will be feeble, and not infrequently the first sound will be absent altogether.

Prognosis.—Though such cases are usually very hopeless, they are not always so; and by prompt, careful treatment a fatal issue may be averted.

Treatment.—The management of these cases is always difficult. The chief essential is the maintenance of rest as far as can be attained, a matter by no means easy of accomplishment in the case of young children. Stimulants should be given with some care lest the enfeebled muscle give way under their influence. Brandy and whisky with small doses of tr. strophanthi are usually resorted to with considerable success. Ten-minim doses of spt. ammon.

aromat., to which three or four minims of spt. chloroformi have been added, will sometimes prove useful. The application of ice over the præcordium is worth bearing in mind. The bowels should be emptied by means of an enema in order to avoid the strain of defæcation. Food should be extremely light, and given in small quantities at frequent intervals. In very urgent cases hypodermic injections of caffeine citrate may be tried.

ENDOCARDITIS.

Under this heading we shall consider the Acute and Subacute forms of this affection, reserving our remarks on Chronic Endocarditis for a separate section (*vide* p. 61, *et seq.*)

Etiology.—The principal causes of endocarditis in children are:—

1. *Acute Rheumatism* in any of its varied forms.
2. *Infectious Fevers*, especially scarlet fever.
3. *Septic Processes, e.g.* acute bone disease.

Under the heading of rheumatism we must specially include chorea which, as will be seen from the chapter on rheumatism (*vide* Chapter XII.), is, in the majority of instances, a rheumatic manifestation. In fact, if we dismiss acute rheumatism as an etiological factor in the production of endocarditis, we leave a very small percentage of cases indeed which can be otherwise accounted for. Scarlet fever, it is true, does produce endocarditis, but the cases which owe their incidence to this disease are only about one-sixth of the number directly produced by acute rheumatism. The association of endocarditis with rheumatism and scarlet fever has led some writers to consider that the pains and joint affection so commonly

seen in the latter disease are probably allied in some way to rheumatism. This practically leads us to regard rheumatism and scarlet fever as being both produced by organismal causes,—a matter which is more and more being forced upon us. It is very interesting to find that acute endocarditis may occur during intrauterine life, and that it may be found post-mortem during infancy.

Symptoms and Physical Signs.—There are, roughly speaking, two groups of cases met with in practice.

I. *Those in which the symptoms and signs of endocarditis are present.*

In such cases the pulse is found to be rapid, and the temperature rises sometimes to a fairly high level, while the breathing tends to become quick, and a condition of dyspnœa or even of orthopnœa may be established. Should a murmur be heard on auscultation the diagnosis becomes almost certain. The most frequent murmur is either a mitral systolic or a mitral presystolic. The second sound is very often found to be reduplicated at the apex, and this reduplication, as Cheadle maintains, is no doubt due to endocarditis of the mitral valve, which is thus rendered more difficult of movement than the unaffected tricuspid valve, which therefore closes before the mitral is able to do so. This reduplicated second sound is not uncommonly succeeded by a soft blowing (diastolic) murmur, the cause of which is somewhat difficult to explain. In some cases the endocarditis is complicated by pericarditis and even by myocarditis, and then we have the symptoms of cardiac affection still better marked.

II. *Those in which the disease is latent and unattended by definite symptoms or signs.*

We may say without fear of contradiction that the larger proportion of cases of endocarditis belong to this

class. In children endocarditis has a special tendency to occur insidiously, and without giving the slightest evidence of its presence until it has existed for a considerable time. The child may be the subject of an acute sore throat or of an attack of "growing pains." The patient is either not kept in bed or only lies down for a few days, and then is sent back to school or play as if nothing serious had been the matter. There can be little doubt that many such children grow up to manhood and to womanhood with valvular disease which was engendered during these so-called slight illnesses so common to childhood's years. We shall return to this matter again when we come to speak of rheumatism, but meantime we cannot too forcibly impress upon those having the care of children the necessity of remembering the risks of heart affection attendant upon certain febrile conditions incident to youth.

There are certain points regarding the endocarditis of children which are worthy of special notice. Thus children who are the subjects of acute or subacute endocarditis become rapidly and markedly anæmic and lose weight very quickly. Acute dilatation of the heart is also very apt to occur in such cases, and may even prove suddenly fatal. Lastly, endocarditis is apt to remain subacute, persisting with most annoying vigour, and even after the symptoms disappear they are very liable to recur from time to time.

Prognosis.—The immediate prognosis is generally good, except in cases complicated by pericarditis and endocarditis. The ultimate prognosis will be good or bad according as the symptoms and signs disappear completely or recur time after time. In some cases, when brought under early and efficient treatment, the damaged valve is re-

stored; but the rule is for such cases, if they live long enough, to show evidences of chronic valvular disease later on in life.

Treatment.—By carefully auscultating and percussing the heart in all febrile states we may be able to recognise the presence of endocarditis, and then by suitable treatment we may be enabled to prevent disaster by establishing a complete and permanent cure. In acute rheumatism, in any of its forms, as well as in scarlet fever, a careful watch should daily be kept over the heart. In both of these diseases prolonged physical rest will do much in the way of preventing endocarditis. If, in spite of our efforts, it makes its presence felt, then we must step in promptly and check its progress. Rest is our principal medical prop here—and by rest we mean not only cardiac, but bodily and mental as well, and this can only be attained by the strictest nursing of the patient. Ice applied over the præcordia has often a marvellous effect in slowing a rapid heart. Digitalis is often necessary, and a prescription which is frequently of the greatest possible service is one combining digitalis with opium, such as the following:—

℞ Tr. Digitalis . . . . ♏xxx.
Tr. Opii . . . . ♏xxiv.
Glycerini . . . . ʒi.
Aq. Menth. pip. ad . . ʒiss.
Misce. Fiat Mist.
Sig.—ʒi. tertia vel quarta hora ex aq.
[For a child of four years.]

The effect of opium in such cases is sometimes marvellous, and should always be given a trial when other remedies fail.

CHRONIC VALVULAR AFFECTIONS.

In this section we shall consider *Chronic Endocarditis and its results.* The recognition of valvular lesions in children is of the very greatest importance. These are followed sooner or later by cardiac hypertrophy and dilatation. If they remain unrecognised and untreated there is grave risk lest the child die ere he reaches adult life from heart failure.

Etiology.—By far the most frequent cause of valvular disease is acute rheumatism, and with this we associate chorea which is essentially a rheumatic affection. Scarlet fever plays a much less prominent part in the production of chronic endocarditis, though we do meet with a certain percentage of valvular lesions which have been brought about during an attack of this fever. Injury is mentioned by some authorities as a cause, but it must be a very uncommon one.

The Nature of the Lesions.—Mitral incompetence is generally considered as being the most frequent of all the forms of valvular lesion occurring in childhood. Mitral stenosis comes next, while some maintain that aortic stenosis is fairly common, others holding the opposite view. Tricuspid stenosis has never been known to occur in childhood, while pulmonary lesions are likewise unknown. These latter, however, may be found in the fœtal state. We shall now consider the symptoms and signs of the more frequently occurring lesions, reserving the consideration of their prognosis and treatment to the end of this section.

1. *Mitral Incompetence.*—This is beyond all doubt the most frequently occurring valvular lesion in childhood. It is met with very often in rheumatic cases, and in

association with chorea in particular. The symptoms may be very unimportant, though cough, palpitation, and undue nervousness may be present. Emaciation and anæmia are often significant, while epistaxis is frequently met with in such cases. At other times we may have very marked dyspnœa, præcordial pain, and a certain amount of dropsy — all of which speak definitely of cardiac disease. Such children are specially liable to attacks of recurrent pericarditis which complicate matters considerably.

The chief physical sign is a systolic murmur audible at the apex, propagated into the axilla, and often heard at the inferior angle of the scapula, while not uncommonly it can be detected at any point on the chest. Accompanying this murmur is a well-marked accentuation of the pulmonary second sound. The heart itself is enlarged, either owing to hypertrophy or to dilatation.

This systolic murmur may be produced by pericarditis, or in many cases by simple dilatation of the mitral orifice, as in febrile conditions and in anæmia. The accentuation of the pulmonary second sound is usually absent in such cases, and this fact, together with the history of the case, will usually enable a correct diagnosis to be made.

2. *Mitral Stenosis.*—This may either exist alone or be associated with mitral regurgitation. The etiology is similar to that of mitral incompetence, while the symptoms presented are chiefly those relating to the respiratory system, such as cough and dyspnœa.

The signs are very characteristic. There is a rough presystolic localised murmur, and along with this is a distinct apical thrill. The first sound is always of a peculiarly sharp and sudden character. The heart will tend to be enlarged more towards the right in this case,

unless the lesion is complicated by the presence of incompetence of the mitral valve as well.

3. *Aortic Stenosis.*—This is not by any means a common valvular lesion in children, though it is occasionally met with. In these cases we get a systolic murmur at the base, associated with hypertrophy of the left ventricle. There may be no symptoms, but a history of previous acute rheumatism can usually be obtained.

4. *Tricuspid Incompetence.*—This may be the result of endocarditis or be subsequent to mitral lesions. It is occasionally met with in infancy, no doubt consequent upon fœtal endocarditis. The signs of tricuspid incompetence are a systolic murmur which is loudest over the lower part of the sternum, and which is accompanied by dilatation of the right side of the heart. The veins in the neck are frequently found to be swollen and prominent.

Other valvular lesions are so rare that we do not consider it advisable to refer to them further in a small work such as this.

Prognosis of Valvular Lesions.—Mitral lesions are not serious in themselves, apart from the fact that the cause is usually an attack of acute rheumatism. Such cases are peculiarly prone to develop recurrent pericarditis and endocarditis, which must necessarily tend to still further weaken the heart. Children suffering from heart affections are liable to show evidences of anæmia, and to become thin and spare. In mitral and aortic stenosis there are always the risks attendant on embolism. Should children with valvular disease suffer later in life from marked pulmonary mischief, the strain of coughing is apt to seriously endanger the already impaired heart's action.

Treatment.—Rest is the most essential part of the treatment of valvular disease. During an attack of acute

rheumatism prolonged rest in bed is absolutely necessary to enable the heart to recover its tone, and afterwards the patient must be enjoined to secure rest in the broadest sense of that term. There must be neither physical nor mental strain. The child may play about with his fellows, but he must not engage in any violent form of exercise. His school-life must be carefully regulated. Home lessons must be reduced to a minimum, and the work of school must be made pleasant and unproductive of fatigue. The child must receive not only nourishing, but easily digested food. Everything likely to cause indigestion and flatulence, such as pastry, must be scrupulously kept from him. His clothing should be warm and light, for pulmonary diseases, when once contracted, always aggravate the cardiac mischief. As most of these children are thin and anæmic a course of iron and cod-liver oil will usually be found advisable.

Medicines, apart from those mentioned, are not necessary, save in cases where there are actual symptoms present requiring treatment. Generally speaking digitalis in the form of the tincture is the most suitable cardiac tonic. It may be given to children in doses varying from 1 to 5 minims according to age. Citrate of caffeine is another useful remedy, and may be given in cases where digitalis is found to provoke gastric disturbance. For restlessness, wakefulness, and palpitation small doses of tinct. opii have proved of great value in the writer's hands. In spite of the fact that children as a rule bear opium badly, heart cases seem to be a striking exception. The dose may range from 1 to 5, or even to 10 minims. Sometimes we have found syr. codeinæ a useful substitute. Strychnine is a remedy of great power, and may often be added to digitalis with advantage. For dropsy diaphoretics,

in the form of hot baths or the liq. ammon. acet. in full doses, are indicated. Failing these, recourse must be had to purgatives such as magnes. sulph., and in very serious cases the use of Southey's tubes may be called for.

We have frequently seen very grave cases of heart failure recover completely under prompt and carefully devised stimulation. Brandy in tea-spoonful doses every hour or two, alternated with a mixture of digitalis and strychnine will often succeed when less active measures would entirely fail to give relief.

It must be remembered, however, that the presence of a murmur is no indication for the use of cardiac tonics. It is only when we notice that compensation is failing that we step in with such powerful agents as those we have named. To give digitalis to a child with a mitral systolic murmur, who is able to run about as actively as other healthy children, is to interfere with the process of cardiac hypertrophy which Nature has already wisely provided as a safeguard.

FUNCTIONAL DISORDERS OF THE HEART.

These form a very interesting group of conditions to which greater attention might be given than has been up to the present. While the disorders met with differ in no respect from those seen in adults, still the fact of their existence during the period of childhood is worthy of note. They are rarely met with during the first ten years of life, but between ten and fourteen they are by no means uncommon.

The varieties of functional disorders most frequently met with may be classified as follows:—

1. Tachycardia.
2. Bradycardia.

3. Irregularity of the Heart's Action.
4. Intermittency of the Heart's Action.
5. Simple Palpitation.

Sometimes combinations of these are presented to us, as in a case under the writer's own care in which the patient, a boy of twelve, had a very slow heart accompanied by very marked irregularity in its action. Again, we have noticed cases in which there was severe palpitation with considerable irregularity of action.

Etiology.

1. *Gastro-intestinal Disorders.*—These have a very common causal relationship to disturbances of the heart's action. In children the presence of threadworms will render the heart rapid and irregular; and in one case we found a persistent condition of tachycardia in association with tapeworms in a girl of thirteen.

2. *The Approach of Puberty.*—This is undoubtedly, next to gastro-intestinal disorders, the commonest cause of functional heart troubles. The strain thrown on the heart at this period of life is very great both in boys and in girls, so that, should the child be anæmic or out of sorts, the chances are that the heart will suffer under the extra strain that is put upon it.

3. *The Worries of School Life.*—These are responsible for many cases of heart trouble in children. It is marvellous to think how little heed is paid to this matter by teachers and even by parents. The work of school-life is a great tax on the developing boy and girl, and there is little wonder that not a few break down under it.

4. *Hysteria.*—The prevalence of hysteria amongst children is apt to be overlooked, but we have come in contact with not a few very pronounced cases, and in some of these the heart has been affected.

5. *Tea and Coffee Drinking, and Cigarette Smoking.*—Children, unfortunately, are often given tea and coffee, while some also surreptitiously fall into the evil habit of cigarette smoking. Smoking amongst children seems to be on the increase, and one of our cases presented a typically rapid and thumping heart from this cause.

6. *As a Sequela of certain Fevers*, especially influenza.

Symptoms.—Many of these cases present no symptoms whatever, that is to say, unless we examine the heart or feel the pulse we would not be aware that anything was wrong. The breathing may in some cases be rapid, but anything like the actual dyspnœa and the cardiac discomfort met with in adults is never seen. In a few cases headaches and giddiness are complained of, but these are more common in the disordered heart of puberty than in any other form of functional affection.

Prognosis.—These cases usually cease to show any signs of cardiac affection after puberty, but sometimes these disorders continue till the patient has grown up to manhood or womanhood.

Treatment.—The treatment consists essentially in attacking the cause. Studies, exercise, and sleep, as well as food and drink, all require to be attended to. Otherwise nothing succeeds so well as a course of arsenic in small doses. Belladonna and digitalis are useful at times, but should not be given as a routine method of treatment. No interference is actually called for in any of these cases, unless the functional disturbance produce evident symptoms.

CHAPTER VI.

INFANT FEEDING.

When we reflect that every year thousands of infants die from the results of improper feeding, it is incumbent upon us to know exactly how an infant should be fed. The subject is beset with difficulties which can only be surmounted by a thorough and practical acquaintance on the part of the physician with the means available for infant feeding. The very fact that artificial foods are so largely advertised may be taken as a sign of the times. These, by their very multiplicity and variety, prove beyond a doubt that medical men are more and more placing reliance upon them in their practice, instead of prescribing, as they ought, the more suitable mixtures of which cow's milk forms the basis.

The principle which must form the foundation of all that can be written with regard to the important subject of infant feeding is that every mother should nurse her child. This is a law to which no exception should be made save on the ground of ill-health. Much harm undoubtedly results from neglect of this fundamental duty. Women nowadays, both of the upper and lower classes, are very apt to shirk what is undoubtedly their first and foremost duty. It may be for social reasons or simply because of evil counsel that breast-feeding is neglected.

Be that as it may, no woman is ever justified in bringing up her infant on milk mixtures or artificial foods when Nature has supplied her with the necessary material for nourishing her babe. An excuse for not nursing the infant commonly enough made, is that the mother has not enough milk. This excuse, however, is one which is very often found on careful investigation to be quite untenable. In by far the larger number of these cases we find that by carefully attending to the diet and general health of the parent, a good milk-supply becomes established within a very short time.

The Diet of a Nursing Woman.—Beyond the fact that this should be somewhat more abundant than at other times, no great change need be made in the mother's dietary, which must consist partly of proteid and partly also of carbohydrate, while these should both be taken somewhat in excess of what the woman has been accustomed to. A fair amount of fluid is also necessary. It is a mistake, however, to suppose that by altering the mother's diet we can greatly influence the milk-supply. By increasing the amount of proteid taken we may raise the percentage of fat in the milk, but only to a nominal extent. If, on the other hand, too much fat is consumed we diminish the percentage of fat in the milk. The amount of proteid is best increased by allowing a greater supply of nitrogenous food, and it is most quickly diminished by increasing the amount of exercise taken by the parent. Malt and oatmeal gruels have a slight influence in increasing the milk-supply, but they are not nearly so potent in this respect as some would have us believe. A useful drink for nursing mothers is made by mixing two tablespoonfuls of Mellin's Food in a glass of warm milk, and this may be taken with advantage two or three times a day.

Alcohol should never be given to women who are nursing. There is not only a slight risk that the child be affected thereby, but also the giving of alcohol in any form is apt to impair the quality of the milk, especially if it is taken in excess. Alcohol certainly increases the amount of milk fat. All this, of course, is apart altogether from the risk the woman runs of forming chronic alcoholic habits.

After each nursing the breasts should be thoroughly bathed, and the nipples smeared over with almond oil. If the nipples are at all painful, a shield is of great service, and when not in use this should be kept in a bowl containing a solution of bicarbonate of soda.

The contra-indications to breast feeding belong to two distinct groups. There is first the group of *constitutional* causes. These include tuberculosis, which may either be latent or active. Marked hysteria in the mother is also a contra-indication to nursing, while the presence of any acute disease usually precludes the possibility of keeping the infant to the breast. Next comes a large group of *local* conditions, including fissured nipples, mammary abscess, lymphangitis of the breast, and malignant disease.

Finally, it must be remembered that no child should be kept on the breast who steadily loses weight in spite of the fact that he is being nursed regularly and carefully.

The composition of human milk has been variously stated by different authorities. The important point, however, to bear in mind is that its composition varies very materially throughout the process of a single nursing. This will be best seen from the following table of percentages:—

	AT BEGINNING.	DURING PROGRESS.	AT END.
Fat.	1·70	2·77	4·51
Sugar.	5·56	5·70	5·10
Proteid.	1·13	0·94	0·71
Ash.	0·46	0·32	0·28
Water.	90·24	89·68	87·50

It will thus appear evident that the *fat* is the ingredient of the milk which shows the most alteration as the nursing act proceeds. As suckling goes on it steadily increases, so that at the end of a single nursing it is nearly three times what it was at the start. Another fact which we glean from the above table is that the proteids are considerably diminished, while the other constituents of the milk remain practically the same throughout.

Certain points require to be attended to if breast feeding is to be a success. Perhaps the most important point of all is to maintain *absolute regularity* in nursing. The great difficulty is not that the mother gives her infant too little, but that she over-nurses it by giving it the breast whenever it cries, its cry indicating to the anxious parent hunger and that alone. The infant must, accordingly, neither be fed too often nor at irregular intervals, as too frequent feeding leads to great increase in the proteid of the milk, and consequently renders it highly indigestible.

Time for Nursing—

During the first month.	Every two hours during the day.
During the second and third months.	Every two and a half hours during the day.

From the fourth to the ninth months.	Every three hours during the day.

After this, as a rule, the infant should be weaned.

The infant should always be waked up to be fed as soon as the nursing hour comes round, and if this habit is acquired from birth the infant will become quite automatic in regard to its times for feeding and for sleep.

Many mistakes are made regarding the nursing of infants during the night. If fed at 10.30 or 11 p.m. he should sleep until 4.30 or 5 a.m., although, in the case of weakly babies, it may be necessary to feed him once between these hours. Healthy infants, on the other hand, often sleep for eight hours at a stretch during the night, with perhaps a tea-spoonful or two of plain boiled water given occasionally, should the infant happen to wake up.

Fifteen minutes should suffice for each nursing, and the infant must never on any account be allowed to fall asleep at the breast. When the nursing occupies more than twenty minutes the milk will usually be found to be deficient in quantity. It is important to see that after nursing the infant is placed quietly in his crib, and allowed to rest there until the next nursing period is due. He must on no account be rocked or shaken about, as these most unnecessary movements tend to cause regurgitation from the stomach.

In those cases in which the quantity of milk is found to be deficient, although its quantity is quite up to the normal standard, the mother's health must be looked to. A change of air, more outdoor exercise, and a more nutritious dietary will often bring about a marked change for the better. When, however, these measures fail

mixed feeding must be had recourse to, in other words we must give the breast and the bottle alternately.

Weaning.—As a rule the most suitable time for beginning this process, which should always be brought about gradually, is the ninth month. The late summer and early autumn months should if possible be avoided, as at these times cow's milk is more apt to produce gastro-intestinal troubles. The process of weaning should occupy at least a month. We may begin by giving the child one feeding from the bottle or spoon in the forenoon. Later an additional feeding may be given in the evening. After a day or two the breast feeding should only be given three or at most four times during the day, until the infant is entirely weaned from the breast.

To begin with the milk mixture should not be given in too great strength; and the following is one which we generally find very useful:—

Milk	6 table-spoonfuls.
Barley Water . .	7½ table-spoonfuls.
Cream . . .	1 large tea-spoonful.
Ordinary Sugar . .	1 small tea-spoonful.

If this should prove too strong, as it may do in some cases, we may dilute it still further by giving only 5½ table-spoonfuls of milk, and increasing the quantity of barley water to 8 table-spoonfuls.

The process of weaning is often beset with difficulties. For a time the infant may refuse everything. By insisting, however, on his taking the milk mixture, he can usually be got to yield. In a great number of cases some gastro-intestinal trouble is present at the start. This is often due either to overfeeding or to too frequent feeding. In other cases it is the milk mixture that is to blame.

Very probably the amount of proteid is too great, and this difficulty can very often be got over by diluting the milk still further.

Once the child has been entirely weaned from the breast he should be fed five times a day. At 7 a.m. he may have milk and barley water, at 11 a.m. white of egg followed by pure milk. At 3 p.m. he should have milk and barley water, and may be allowed to nibble at a crust. At 7 p.m. he should have pure milk, and his last meal should consist of milk and barley water.

Weight and Growth in Relation to Breast Feeding.— It is not an easy matter to state anything very definite with regard to weight and growth during infancy. At the same time the following table may be taken as giving a fairly accurate representation of the matter:—

	Gain per week.
During the first three months . .	6 ozs.
During the second three months .	5 ozs.
During the third three months . .	3 ozs.
During the fourth three months . .	2 ozs.

When the infant's weight remains stationary during any particular period, this must be looked upon as suspicious; but more importance should be attached to the fact that the child is losing weight, as no child can do so unless a deterioration is taking place in his health at the same time.

Whenever an infant ceases to gain weight, or begins to lose, we look first to the mother's state of health, and then to the condition of her milk, and her habits as regards nursing. If these are found to be satisfactory, then our attention must be turned to the infant himself.

While the question of an infant's weight is of great

importance, its *growth* must not be overlooked. When the growth is stunted it may indicate some disturbance of nutrition, or it may be an indication of mental conditions such as cretinism and amentia.

When an infant does not thrive satisfactorily upon breast milk, or when the mother is unable to nurse her child, then recourse must be had to *artificial feeding.* This is often very unsatisfactory even when carefully managed, and success can only be achieved by considering each individual case upon its own merits, as probably no two infants will continue to gain weight under exactly the same conditions of artificial feeding.

As artificial feeding always necessitates the use of a feeding bottle, we may now briefly refer to this matter. Roughly speaking there are two classes of feeding bottles which may be used: (*a*) *those with a long rubber tube*, and (*b*) *those with a simple teat.* The first class is not really available at all, as such bottles cannot possibly be kept clean; and besides, their use is calculated to foster neglect on the part of the nurse, who, when a long tube bottle is employed, usually leaves the infant to feed at its own sweet will. Of feeding bottles with a simple teat there are quite a variety, but, so far as we have been able to judge, the Allenbury type, of which an illustration is given, is undoubtedly one of the best in the market. Its special advantage is that it possesses a through channel which enables the bottle to be regularly cleansed after use.

When breast feeding has to be given up, a substitute must inevitably be found, and the basis on which all substitutes are prepared is that of human milk. It is well to point out, however, that no analysis of human milk can really be taken as an ultimate standard, for we find that one infant will thrive on a milk of very different

percentage composition from that on which another child is nourished. There can be no doubt whatever that each individual mother's milk specially meets the requirements of her own particular infant. We have always maintained, therefore, that any artificial food which attempts to imitate in percentage composition that of average breast milk cannot possibly be expected to meet the requirements of every infant. This is why we find that while some particular food may be taken with impunity (we do not say with advantage) by one infant, when given to another there result malnutrition and gastro-intestinal disturbances. It is a gross fallacy to suppose that the food which most nearly approaches in percentage composition that of mother's milk is, and must be, the ideal substitute for the latter. By placing credence in this fallacy most disastrous and injurious results are sure to follow in practice.



FIG. 4.—The Allenbury Feeder.

When we come to inquire what is the best and at the same time the simplest substitute for human milk, we are bound to admit that it is that of the cow. Unfortunately the percentage composition of bovine milk differs very materially from that of human milk. Different writers on the subject supply different figures, but the following may be taken as fairly representative of the percentage composition of human and bovine milk :—

[TABLE

	HUMAN.	BOVINE.			
	Normal Average.	English.	American.	French.	German.
Fat.	3·30	3·70	3·75	4·00	3·69
Sugar.	6·80	4·48	4·42	5·00	4·88
Proteids.	1·50	4·06	3·76	3·40	3·55
Ash.	0·20	0·76	0·68	0·60	0·71
Water.	88·20	87·00	87·39	87·00	87·17

Certain deductions are readily made from the above table :—

1. The amount of fat is practically the same in bovine as in human milk.

2. The amount of sugar is considerably less in bovine than in human milk.

3. The amount of mineral matter present is, for all practical purposes, the same in both.

4. The proteid material in bovine milk is greatly in excess of that found in human milk. Generally speaking the proteid of cow's milk is nearly $2\frac{1}{2}$ times as much as in breast milk. Not only is the amount of proteid greater in bovine milk, but the casein of the latter forms large and tough masses in the stomach, which are very difficult of digestion ; whereas the casein of human milk forms small and soft coagula, which are readily digested.

5. Bovine milk as we receive it from the dairy is acid, whereas human milk is alkaline in reaction. It is well to remember, however, that cow's milk when freshly drawn is not acid, but is either alkaline or neutral.

6. Bovine milk contains a large number of micro-organisms, whereas human milk is absolutely sterile.

The Preparation of Cow's Milk for Infant Feeding.—The first step in the process is the addition of a diluent in order to reduce the amount of contained proteid. As this dilution diminishes the amount both of the fat and also of the sugar, we must add cream and a certain amount of lactose before giving the diluted milk to the infant. A tea-spoonful of cream will usually be found sufficient for each feeding, and half a tea-spoonful of lactose may be added to each bottle. As a diluent barley water is to be preferred, as it seems to help in breaking up the curd. Instead of barley water, however, plain water or lime water may be employed. The degree of dilution must be carefully regulated according to the age of the infant, and also according to his power of digestion. The degree of dilution we generally employ is as follows:—

First week . .	One part of milk to three parts of barley water.
Second week . .	One part of milk to two and a half parts of barley water.
Third week . .	One part of milk to two and a half parts of barley water.
Fourth week . .	One part of milk to two parts of barley water.
Second and third months .	One part of milk to one and a half parts of barley water.
After the third month. .	Equal parts of milk and barley water.

Although we cannot prescribe stock milk mixtures which will suit every individual case, the following tables show the amounts of ingredients contained in the mixtures which we are in the habit of using:—

	DURING 1ST MONTH.	DURING 2ND MONTH.	DURING THE 3RD TO THE 6TH MONTH.	DURING THE 6TH TO THE 9TH MONTH.
Milk.	2 to 4 tea-spoonfuls.	2 table-spoonfuls.	3 to 4 table-spoonfuls.	5 to 8 table-spoonfuls.
Barley Water.	6 to 8 tea-spoonfuls.	3 table-spoonfuls.	3 to 4 table-spoonfuls.	5 to 8 table-spoonfuls.
Cream.	1 tea-spoon-ful.	1 tea-spoon-ful.	1 to 3 tea-spoonfuls.	2 to 4 tea-spoonfuls.
Sugar.	1 small tea-spoonful.	1 small tea-spoonful.	1 tea-spoon-ful.	1 tea-spoon-ful.

Having provided for the dilution of the milk and the addition of the necessary amount of fat and sugar, there still remains the question as to rendering the milk mixture sterile. Many suggestions on this subject have from time to time been brought forward. Each of these, however, may be classified under one or other of the following headings:—

1. *Sterilisation.*—In this process the milk is brought to the boiling point, and kept boiling for from fifteen to thirty minutes. It is then removed from the steriliser and allowed to cool. Complete sterilisation cannot be attained under one and a half or even two hours at this temperature.

2. *Pasteurisation.*—The milk is here raised to a temperature which is variously given by different authorities, and which is probably best stated as being 158° Fahr. After being brought to this temperature and maintained there for at least half an hour, the milk must then be cooled rapidly. The infectivity of any tubercle bacilli that may be present is in part diminished, and all spore-bearing organisms devitalised when the milk has been kept at this temperature for five or ten minutes. Unfortunately this method is not entirely reliable, as when the milk has been obtained from a tuberculous source it proves ineffectual.

3. *Simple Boiling.*—Perhaps the term *scalding* is more appropriate, as the milk is brought almost to the boiling point. By this means certain of the pathogenic organisms usually present in milk are destroyed.

Of all three methods we personally prefer the last mentioned. We object to pasteurisation on the ground that milk so treated will only remain pure for a very short time.

The sterilisation of milk is a question which has always been keenly contested; some writing strongly in its favour, while others denounce it. Personally we cannot give it our commendation, as time and again we have found that the use of sterilised milk for any length of time is sure to produce rachitis or scorbutus, and at the same time imperfect nutrition and anæmia. We believe this to be due to interference with the assimilation of fat, and also to some extent to a destruction of part of the milk sugar which becomes distinctly altered during the process of sterilisation.

With regard to simple boiling or scalding we can speak very favourably. It certainly aids digestion by producing a looser coagulum in the stomach. Its great drawback is that the fat assimilation is somewhat interfered with owing to the fat globules becoming surrounded by a covering of proteid material, which is not readily disintegrated during the process of digestion.

A very useful form of apparatus for the preparation of milk for infant feeding is that known as the Aymard Patent Milk Steriliser.

The method of employing this simple apparatus is as follows:—Hot water to the depth of half an inch is placed in the lower saucepan. The lid is then put in position and the water allowed to boil. The lid must now be re-

moved and the milk container with the necessary amount of milk placed in position. The large lid is then replaced over the top. In from 10 to 15 minutes steam will be given off freely from the lid. The milk must then be cooled by placing the upper part of the steriliser in a basin of cold water, care being taken not to remove the inner lid until the milk is cooled, which will take from five to ten minutes. The milk may now be poured off into a jug. The lids of the steriliser must not be replaced until the apparatus is brought into use again. In this instrument the milk chamber acts as a condenser, and no steam is given off from the lids until the milk has reached a temperature of 195° Fahr. If left on the fire the temperature of the milk can only run up to 212° Fahr.

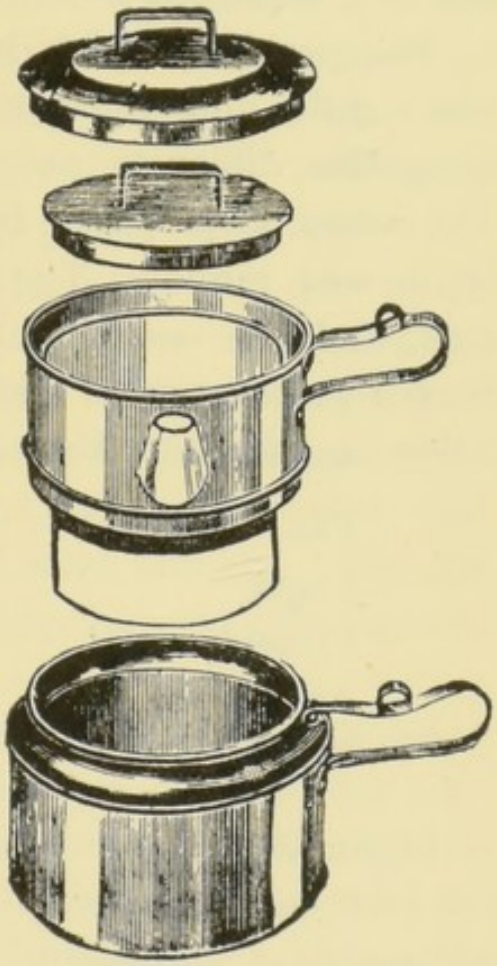


FIG. 5.—The Aymard Patent Milk Steriliser.

Instead of cow's milk that of the ass or of the goat is sometimes employed. The former has a low percentage of proteid and fat, and is often used very successfully during the first two or three months. Goat's milk, on the other hand, more nearly resembles in composition that of the cow, with one exception, namely, that the curd of goat's milk is considered to be somewhat looser, a fact which we very much doubt, as goat's milk when given to infants very often produces vomiting.

Although a mixture made from diluted cow's milk is

undoubtedly the simplest and most practicable that can be obtained, it not infrequently occurs that the infant fails to thrive on such mixtures. The difficulty usually lies in the proteid which the infant is unable to digest.

The problem which has to be faced is how to utilise cow's milk and yet get rid of the proteid. By using *whey* this difficulty can be to a large extent got over. The whey is prepared from milk by coagulation of the latter with rennet. The curd must be thoroughly separated, and the resulting liquor strained through muslin. Such a preparation of whey gives an analysis of which the following may be taken as a fairly accurate statement:—

Fat	1·00 per cent.
Sugar	4·79 „
Proteid	0·86 „
Ash	0·15 „
Water	93·20 „

From this analysis it is evident that the object desired has been achieved, viz., the production of a food material containing a minimum of proteid. The whey may be diluted with barley water to any extent; and, if necessary, cream may be added.

When whey mixtures are found to be unsuitable *peptonised milk* may be resorted to. For this purpose peptogenic milk powder will be found most convenient. This powder is supplied in bottles with directions for use. The following is the method of preparing the milk mixture from it:—

We take one measure (that is the metal cup supplied with the bottle) of the powder, half a pint of cold water, half a pint of cold fresh milk, and four table-spoonfuls of cream. We then place these in a saucepan, stirring the

mixture constantly over a slow fire until it begins to boil. It should be so heated that it is brought to the boil in ten minutes. The quantity so prepared is then to be placed in bottles, which are to be kept in a cool place. Before each feeding one of these is placed in hot water so as to bring the food to the proper temperature. When the digestion is very feeble, or gastro-intestinal trouble is present, the milk may be specially prepared as follows:— The same amount of ingredients are taken and placed in a clean bottle which is well shaken. This must then be put into a gallon of water which is as hot as the hand can bear, and kept there for exactly half an hour. The mixture must then be poured out into a saucepan, and rapidly heated to boiling, with constant stirring. By this means the casein is more thoroughly digested than by the ordinary method of preparation.

The great drawback to the use of peptogenic milk powder is its expense. Moreover it should not be used for any length of time, as it tends to render digestion feeble. It is said on good authority that this powder consists largely of lactose. The analysis given by Leeds of milk modified with peptogenic milk powder is as follows:—

Fat	4·50 per cent.
Lactose	7·00 „
Proteid	2·00 „
Ash	0·30 „
Water	86·20 „

This analysis, it will be observed, approaches very closely to that of ordinary breast milk.

Reference may now be made to *milk prescriptions* and *milk laboratories*. It is to Rotch that we owe the initiation of this system, which has perhaps done more than

anything else to revolutionise the whole process of infant feeding. The underlying principle of the system is the formation of milk mixtures which shall resemble the average percentage composition of human milk at different periods during lactation. Milk laboratories have now been established in most of our large cities, and they have proved of considerable benefit. The great drawback to them is that the medical attendant and the parent both require to exercise a considerable amount of intelligence in order to carry out the system properly. The value of laboratory milk is best seen during the summer and autumn months. There can be no doubt whatever that laboratory milk is distinctly purer than anything that can be obtained from the ordinary dairy. The great risk, perhaps, is lest the physician acquire the habit of prescribing routine mixtures according to the particular age of the infant. It must be carefully borne in mind that the requirements of every infant vary very greatly as regards their digestive powers, and, accordingly, the milk prescription must be modified to suit each individual case. The main object aimed at by the laboratory milk is the obtaining of a pure food for the infant, but surely it is of greater consequence still to attend to the prime source of the milk-supply. In other words, it is our dairy farms that require supervision. We know that boiled and sterilised milk may lead to serious disease, and hence it is most important that we should use fresh milk, and surely it is a more important duty to supervise our dairy-supply, rather than to interfere in any way with the milk after it has been delivered to the consumer.

Where ordinary cow's milk or the substitution of whey fails to bring about satisfactory results, we may sometimes have recourse to the use of *condensed milk*. In

using this form of nourishment we have to bear in mind that all such milk is practically sterilised. Condensed milk may be had either sweetened or unsweetened, the unsweetened being probably the more satisfactory. The following table of analyses may be of some service :—

	SWEETENED.		UNSWEETENED.
	Nestlé's.	Milkmaid.	Ideal.
Fat.	13·70	11·21	10·56
Sugar.	37·20	53·63	10·85
Proteid.	9·70	9·03	8·42
Ash.	2·02	2·84	1·99
Water.	37·38	23·29	68·18

From these analyses it would appear that the percentage composition is a very satisfactory one, but in using condensed milk we have to begin by diluting it with 14 parts of boiling water, and then as the infant grows older we gradually add less water, but never less than 7 parts. When condensed milk is so diluted the percentage composition is very considerably reduced. Thus the tables given above are altered in the following manner :—

	NESTLÉ'S.		MILKMAID.	
	Diluted with 7 parts water.	Diluted with 14 parts water.	Diluted with 7 parts water.	Diluted with 14 parts water.
Fat.	2·14	1·16	1·70	0·92
Sugar.	8·15	4·42	8·26	4·48
Proteid.	1·51	0·82	1·50	0·82
Ash.	0·25	0·14	0·36	0·19
Water.	87·95	93·46	88·18	93·59

It will thus appear that, when diluted, *condensed milk contains very little fat*; the fact is some brands contain less than 1 per cent of this ingredient. Infants fed on condensed milk rapidly become anæmic and rachitic, while they suffer from fat starvation. Condensed milks, therefore, can only be employed temporarily in order to bridge across the digestive difficulty, and to serve as an intermediate mode of feeding till more nutritious mixtures can be digested. In no case should condensed milk be given for more than a few weeks at a time, and it is always advisable to add cream in order to bring up the percentage of fat to the normal standard. It must be granted, however, that if properly used, condensed milk is often of the greatest possible service in difficult cases of infant feeding.

When all has been said regarding the use of cow's milk as a substitute for breast feeding, it must be admitted that milk mixtures having the same percentage composition as human milk do not have their ingredients related to each other in the same intimate way as they are in original milk. The milk tables in use in laboratories do not take into account the fact that breast milk varies throughout the same day and from day to day. In fact there is no necessity whatever for such elaborate accuracy as is observed in these tables. We have long ago come to the conclusion that an infant will digest almost any milk mixture, provided he is originally healthy, as the stomach very soon accommodates itself to change in the diet. The important point is to see that the milk mixture is sufficient in the amount of its essential ingredients. So tolerant is the healthy infant's stomach that we often find healthy infants giving no evidence whatever of digestive disturbance when fed on certain artificial foods; but though their digestion is

not upset thereby, they fail to thrive because the food does not contain a proper proportion of the necessary constituents, fat being the ingredient which is most commonly found to be deficient.

We shall now consider the vast subject of *Artificial Foods*, of which the number seems to be year by year increasing. Every advertised artificial food puts forward as its claim to recognition the fact that it most nearly resembles in percentage composition that of human milk. This, however, is a very great fallacy, because no matter how nearly any particular food approaches the composition of human milk, it cannot possibly be suited to the needs of every infant, seeing that the composition of human milk varies very markedly in each individual case. We consider that this fallacy has done more to produce rachitic and scorbutic infants than even the bad methods of feeding which we witness amongst average hospital and even private patients.

The subject of artificial foods is a vast one, and we cannot do more at the present time than briefly refer to them. In order to simplify the subject we venture to suggest the following somewhat artificial classification :—

I. Milk Foods.

Allenbury Food, No. 1.

II. Foods Containing Milk and Cereals.

(A) *Those containing no starch.*

1. Allenbury Food, No. 2.
2. Horlick's Malted Milk.
3. Mellin's Lacto-Glycose.

(B) *Those containing starch.*

1. Carnrick's Soluble Food.
2. Nestlé's Milk Food.
3. Manhu Infant Food.

III. Foods Containing Cereals.

(A) *In which the starch is completely unaltered.*

1. Neaves' Food.
2. Ridge's Food.
3. Chapman's Whole Flour.
4. Scott's Oat Flour.
5. Opmus Food.
6. Bananina.

(B) *In which the starch is incompletely altered.*

1. Allenbury Malted Food.
2. Benger's Food.
3. Savory and Moore's Food.
4. Frame Food.
5. Hovis Food, No. 2.
6. Coomb's Malted Food.
7. Cheltine Infant's Food.
8. Albany and Worth's Food.
9. Falona.
10. Nutroa Food.

(C) *In which the starch has been completely altered.*

1. Mellin's Food.
2. Hovis Food, No. 1.
3. Moseley's Food.
4. Diastased Farina.
5. Cheltine Maltose Food.

In the first group, which we have termed milk foods, the Allenbury Food, No. 1, may be taken as a typical example. It is intended to be used until the third month. It is practically a milk powder, which only requires the addition of hot water and cream to furnish the necessary milk mixture. Half an ounce of the food is taken, and to this sufficient hot water is added to make the total amount measure three ounces. During the first two months one and a half to two ounce feeds of this may be given every two hours; while from the second to the third months two to three ounce feeds may be given every three hours. The analysis of this mixture shows a percentage of one of proteid, three of fat, and five of sugar. The great disadvantage of this type of food is that the milk is not fresh.

The second group of foods which contain milk together with cereals is composed of two distinct classes—those containing no starch, and those which have more or less starch in their composition. The Allenbury Food, No. 2, is intended for infants from the third to the sixth month, Its composition is similar to that of the No. 1 Food already alluded to, but it contains a small proportion of maltose, dextrine, soluble phosphates, and albuminoids. The makers are careful to point out that this food must not be used after the sixth month, even should the child seem to thrive upon it. When made according to the directions, it shows a percentage composition of nearly two of proteid, three of fat, and ten of sugar.

Horlick's Malted Milk, another favourite infant's food, is not suitable for young infants, owing to the fact that it dispenses altogether with the use of fresh milk. The same objection is applicable to Mellin's Lacto-Glycose, which is simply a modification of Mellin's Food with the addition of milk powder.

Carnrick's Soluble Food contains milk powder with the addition of dextrine and soluble wheat starch. It is said to be an ideal food for infants and young children. It is, however, quite unsuitable for the needs of the former, owing to the fact that it contains a large amount of starch. The same remark applies to Manhu Infant Food.

So far, all the foods we have mentioned may be perfectly suitable as *temporary* expedients when fresh milk cannot be obtained, but they are quite out of the question as substitutes for fresh cow's milk.

The third group of foods, viz., those containing cereals, are those which are at the present time most exploited by their manufacturers. All of those in which the starch is completely unaltered are unsuitable for infants under nine months of age. Infants, when fed upon them to the exclusion of ordinary milk, are certain to become rachitic and to give evidence of gastro-intestinal disturbance. Almost the same may be said of the class in which the starch is incompletely altered.

Those in which the starch has been completely altered are the foods which may for a time be employed in infant feeding, even during the earlier months; the two best in our opinion are Mellin's Food and Hovis Food, No. 1.

In order to prepare Mellin's Food, the requisite amount of food is mixed with a little hot water into a smooth paste, the remainder of the necessary amount of water is added, and then the proper quantity of milk. The ingredients are then to be thoroughly mixed. It is quite unnecessary to add sugar, and the mixture must not be boiled. The proportions of Mellin's Food and milk and water require to be varied to suit the individual case, and the manufacturers state that it is sometimes necessary to reduce the amount of milk. This would, unfortunately,

mean a diminution in the amount of fat, and there is no mention whatever of adding cream in the preparation of this food. The great drawback to Mellin's Food is undoubtedly its deficiency in fat,—a fact which cannot be denied when the food is prepared according to the directions given.

Hovis Food, No. 1, consists largely of digested and transformed carbohydrates. It is intended to be prepared with milk. It is, however, deficient in fat, so that in its preparation it is advisable to add cream.

There are several foods which we have passed over because we do not consider them at all satisfactory for infant feeding, although no doubt they are very largely employed, not only by the laity, but even by the profession. We would state again that the great objections to every artificial food may be grouped under one or other of the following headings:—

(1) That they are not intended to be used with fresh milk.
(2) That they contain starch, which is quite indigestible during the period of early infancy.
(3) That they contain far too little fat.

The results which are obtained by giving infants these various foods are far from satisfactory. Rachitis, in one or other of its manifestations, is almost certain to supervene, while scorbutus and gastro-intestinal disorders are very common. Doubtless such infants make excellent photograph babies. They become plump, and to the uninitiated eye are seemingly well nourished. Unfortunately their increase in weight is not due to the formation of valuable muscle fibre, but to an enormous increase of soft, flabby, and inert tissue.

Diet after Weaning.—Pure milk should be the infant's principal article of food for some time after weaning. In addition he may have one or other of the various malted foods such as Mellin's, while almost anyone of the second or third group of artificial foods are now quite suitable, although at an earlier age they are not. In particular Milo Food, quite recently introduced, can be recommended for infants at this stage. It consists of milk powder mixed with ground wheaten biscuit, and forms an admirable addition to the dietary. A little well-boiled oatflour is also a useful article of diet; and towards the end of the first year eggs and bread crumb or gravy may be allowed.

Diet at Eighteen Months.—At this age the infant should have four meals a day. For breakfast he may have well-boiled oatmeal porridge and milk, or an egg softly boiled or scrambled, and a little bread and butter. For lunch he should have clear soup, a very small piece of roast mutton, or breast of chicken, or occasionally a little steamed white fish. With this he may have a dessert-spoonful of mashed potato, with spinach or cauliflower. Stewed fruit or custard will form his dessert. For tea, he may have bread and milk, or custard with bread and butter and a little fruit; while for supper, bread and milk, or Mellin's, or Milo Food may be given. Nothing should be taken between meals unless a couple of dry biscuits, or a hard crust of bread.

Diet after the Second Year.—Much of the diet list immediately preceding is still applicable—although, of course, a little more may be given at each meal. Milk should remain a constant article of food throughout childhood, while eggs and fruit in its season should be liberally supplied to children. No tea or coffee should be given to young children; while sauces and spiced dishes

must be strictly avoided. It is well to see that a sufficiency of water is given them each day to drink.

The subject of infant feeding would not be complete without a reference to *the value of cod-liver oil as a food.* The mistake which is usually made is that of giving too much at a time. Ten drops after the morning meal and at bedtime will be found a sufficient quantity for young infants, and even at two years of age one-half to one tea-spoonful twice daily is an ample amount. At the present time there is a tendency to employ emulsions of petroleum; these, however, are absolutely useless, as, being made from a mineral oil, they are not at all absorbed. Their sole action is that of a lubricant. Of emulsions of cod-liver oil there is a large and varied number. Many of them are emulsions only in name, while others again contain far too little oil. The one from which we have obtained the best results is known commercially as Nutrol. This contains 70 per cent of pure cod-liver oil.

Our recent experiments with Virol prove it to be a very valuable substitute for cod-liver oil. It consists of bone marrow, malt, and eggs. It therefore contains a large percentage of fat in a form which is readily assimilated. It is of special value in hot weather when cod-liver oil is not tolerated. It may be added to the infant's food, as it is perfectly miscible with milk and water, forming a perfect emulsion which neither globulates nor separates.

CHAPTER VII.

DISEASES OF NUTRITION.

MALNUTRITION.

THIS is a condition of very common occurrence, both among infants and children generally.

Etiology.—One of the commonest causes is undoubtedly the rash use that is now made of artificial foods in the rearing of infants. Were breast feeding more commonly adopted, one would see fewer cases of malnutrition in daily practice.

During childhood the strain of school life is often accountable for many of the cases one sees. Neglect of the ordinary hygienic principles of life may lead eventually to the production of a body which is ill-nourished. Malnutrition may also result from tuberculosis, syphilis, and rheumatism, while it is exceedingly common after gastro-intestinal troubles, pneumonia, and various fevers.

Symptoms.—A marked feature in all cases is the defect in the weight of the patient, while development is backward. Pallor is present in a greater or less degree. Gastro-intestinal troubles are very common, so that vomiting is frequently complained of, while attacks of severe diarrhœa are often seen. The patient is always fretful and irritable, and is not readily amused.

Diagnosis.—A diagnosis of malnutrition in the infant



PLATE IV.—Male Infant, æt. 8 months, suffering from Marasmus.

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or of debility in the child, is very often made when in reality a more definite name could be given to the patient's condition. Careful inquiry should always be made regarding the feeding of the child, and also as to his hygienic environment. If these are found to be satisfactory all general constitutional conditions should be carefully inquired for. The chest and abdomen should be examined in every case, as it is so easy to overlook an unresolved pneumonic patch or a few enlarged mesenteric glands.

Prognosis.—Generally speaking these cases are favourable as regards their ultimate termination, recovery being the rule. At the same time it must not be forgotten that when there is a pre-existing constitutional condition the prognosis is not nearly so satisfactory.

Treatment.—The greatest care must be given to the feeding, as gastro-intestinal disturbances are so easily provoked by the slightest error in diet. It is necessary that great precautions should be taken in planning out the feeding of the patient. Peptogenic milk powder is frequently of service in these cases, and cod-liver oil is very often helpful. Attention to fresh air and cleanliness of the body are essential parts of the treatment.

When constitutional conditions are present, such as tuberculosis, rheumatism, or syphilis, these must be treated on general principles. For the rest regular weighing will be necessary if we are to make sure of the progress, or otherwise, of the patient under our care.

MARASMUS.

When malnutrition reaches an extreme grade we term it marasmus. This is most frequently seen during the first few months of life. It is best to restrict the term

perhaps to those cases which are the result of some definite constitutional disease. For the sake of simplicity, however, we will consider marasmus as applicable to any condition which produces marked wasting of the infant.

Etiology.—Marasmus may be the result of an improper milk-supply, or it may be due to the unhealthy surroundings of the infant. The presence of congenital pyloric stenosis often leads to very marked marasmus; while vomiting and diarrhœa, when allowed to run a somewhat chronic course, are very often followed by marked wasting. Two other causes of marasmus must not be forgotten; these are congenital syphilis and tuberculosis. Many infants develop marasmic symptoms when fed upon artificial foods in which, as a rule, the fat is very deficient.

Symptoms.—The infant rapidly becomes emaciated. The face has an old and anxious look. The skin on the body and limbs hangs in loose folds about the bones, and it is dry and shrivelled. The extremities are cold, and the infant is constantly fretful and restless. The cry is hoarse and feeble. The fontanelle becomes depressed, and unless treatment is promptly resorted to, death will inevitably supervene.

Diagnosis.—The diagnosis rests in these cases between simple atrophy, due to deficient assimilation of the food, and congenital syphilis, or it may be general tuberculosis. It is almost impossible to differentiate a case of the latter from one of simple atrophy, unless there be some local condition present. The evidence of congenital syphilis is usually more marked, and therefore the diagnosis between this condition and that of simple atrophy is generally a comparatively easy matter.

Prognosis.—The prognosis is not as a rule very good.

Much will depend upon the ultimate cause of the condition, and the means of treatment available.

Treatment.—The chief mode of treatment is by diet. We must begin by giving a milk mixture which contains a very small percentage of fat and also of proteid, and in many cases a mixture containing whey as a basis is found to be very suitable. As has been pointed out by more than one writer on the subject, such infants are usually capable of digesting a fairly large amount of sugar, and therefore the mixture fed to the infant should contain a relatively large amount of this ingredient.

Care should be taken to maintain the body temperature, and this can readily be carried out by rolling the infant in cotton wool. Although attention to cleanliness is essential such infants should never be bathed, but merely sponged over once a day with tepid water. Ventilation is likewise of importance, as is also the treatment of any constitutional cause underlying the condition.

RACHITIS.

A common mistake made by those who are not conversant with this disease is to suppose that rachitis is purely and simply a bone disease, whereas it is one which involves other structures as well.

Etiology.—The chief cause of rachitis is artificial feeding. There is probably no infant who has been reared on some artificial food but presents, to a greater or less degree, symptoms which the practised eye of the pediatrist recognises to be those of this disease. Breast-fed infants never become rachitic, provided they have plenty of sunlight and fresh air; when, however, the latter are deficient rickets is almost sure to develop.

Infants, likewise, who are kept on breast milk beyond the ninth month are very liable to become affected, as the milk then becomes defective in the necessary percentage of ingredients.

Other causes assigned for the development of rickets are comparatively unimportant. Congenital syphilis and tuberculosis have a tendency to produce rickets in those who inherit these diseases, while the existence of any debilitating disease may likewise induce the onset of this condition.

Symptoms.—Rickets is probably as much a disease of mucous membranes as it is of bones. Very often the first evidence of rickets, which by the way almost always shows itself between the sixth and twelfth months, is some disturbance of the gastro-intestinal tract. In addition to gastric catarrh, which is evidenced by the presence of vomiting, we have usually more or less intestinal catarrh or diarrhœa present, which may alternate with constipation. Bronchitis is another evidence of the proneness to catarrhal processes in these children. Other catarrhal conditions met with in the course of rickets are eczema, rhinitis, otorrhœa, and conjunctivitis. It is very rare to meet with a rachitic infant whose tympanic membrane is absolutely perfect, and it is now known that adenoids are very prevalent in children affected with rickets. The teeth are usually late in appearing, and do so in quite an irregular fashion. When they do make their appearance, they are defective and are found to decay with extreme rapidity.

The condition of the blood in rickets is of some importance. In many instances we find that the patient is pale and thin, with an enlarged spleen, and a transparent skin, through which the veins of the head and

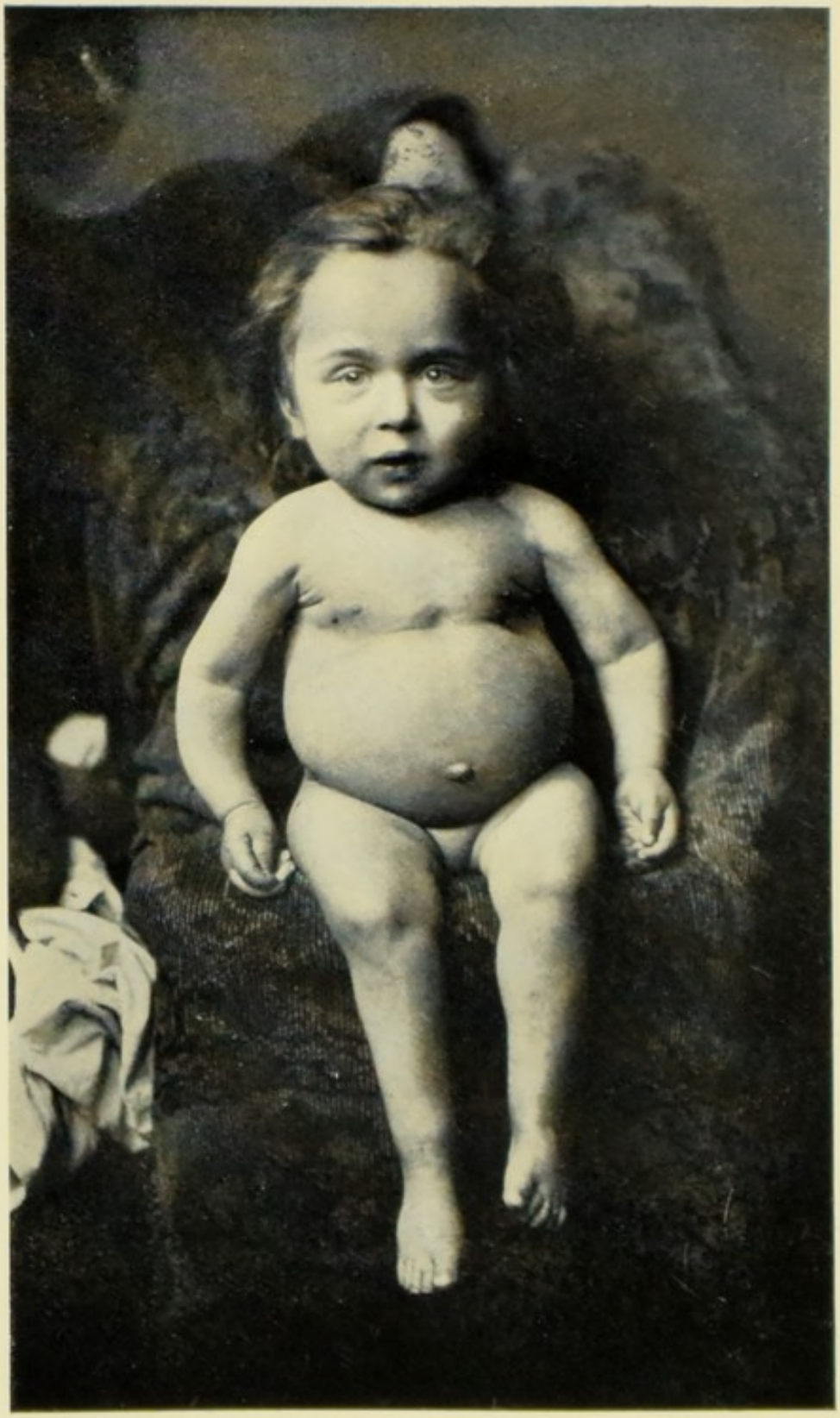


PLATE V.—Female, æt. 2½ years, suffering from Rickets. The characteristic appearance of the thorax and abdomen is well shown, while the curvature of the upper extremities is well marked.

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upper part of the chest appear distinctly prominent. In the other type of case the infant is big and flabby. The latter form of the disease supplies most of the photographs which adorn the advertisements in favour of artificial foods.

Profuse sweating, especially marked about the head, is a very prominent feature, as is also restlessness, so that the child is apt to be peevish and restless while awake, and when in its crib tends to throw off the bedclothes, thus rendering him more liable to take cold.

The disease usually commences between the sixth and the ninth months. At first there may be only some tendency to gastro-intestinal trouble, but after a time the more marked symptoms set in. Tenderness is sometimes one of the earliest of these, but, as a rule, it is seldom very marked in uncomplicated cases. The first evidence of rickets which calls the attention of the parent to the condition is enlargement of the articular ends of the bones. This enlargement is most noticeable at the wrist, but the ribs are also affected, and this bead-like thickening which occurs constitutes what is known as the rickety rosary. Not only do the ends of the bones become enlarged, but the shafts become soft and bend readily. This bending is often very well marked in the tibiæ, but it may also occur in the bones of the upper extremity. This feature of bending is very well seen in the case of the child whose photograph will be found on the opposite page. The skull as a whole becomes enlarged, and may either assume a somewhat square shape, or it may show distinct bossing of the frontal bones with a well-marked groove between. Not infrequently the lower jaw assumes a somewhat altered appearance owing to the sharp angle which is formed at its sides. The anterior fontanelle is large and

open, and its margins are thinned. In the occipital region one can often make out pieces of bone which have a parchment-like feeling when pressed upon with the fingers. This condition is known as cranio-tabes, and occasionally it may be very extensively present.

In some cases when there is marked muscular debility we find distinct spinal curvature present, which may readily be mistaken by an unpractised observer for disease of the spine.

We have already referred to the rickety rosary, but in addition we not uncommonly find a distinct lateral groove in the lower costal region. This groove is usually more marked on the left side of the chest than on the right. The well-known pigeon breast, or keeled sternum, as it is commonly termed, is of very frequent occurrence in rachitis.

The ligaments about the joints always show more or less laxness in this disease, so that the foot may be turned almost through a complete circle, and the ligaments about the hip-joint are often so loose that the child's feet can be placed upon the back of his neck. The muscles participate in this weakness. Thus the child is late in sitting up, and is late in walking or even in standing.

The abdomen of a typically rachitic child is very prominent and stands out in relief below the somewhat contracted chest. This comparison is well shown in the preceding photograph. The cause of this increase in the size of the abdomen is largely due to lack of muscular tone, so that the intestines become distended with flatus. In the anæmic type of rickets the spleen is usually found enlarged, but this enlargement may be present in the other variety as well. The liver is sometimes found to be enlarged, but this is not nearly so common an accompaniment of rickets as is enlargement of the spleen.

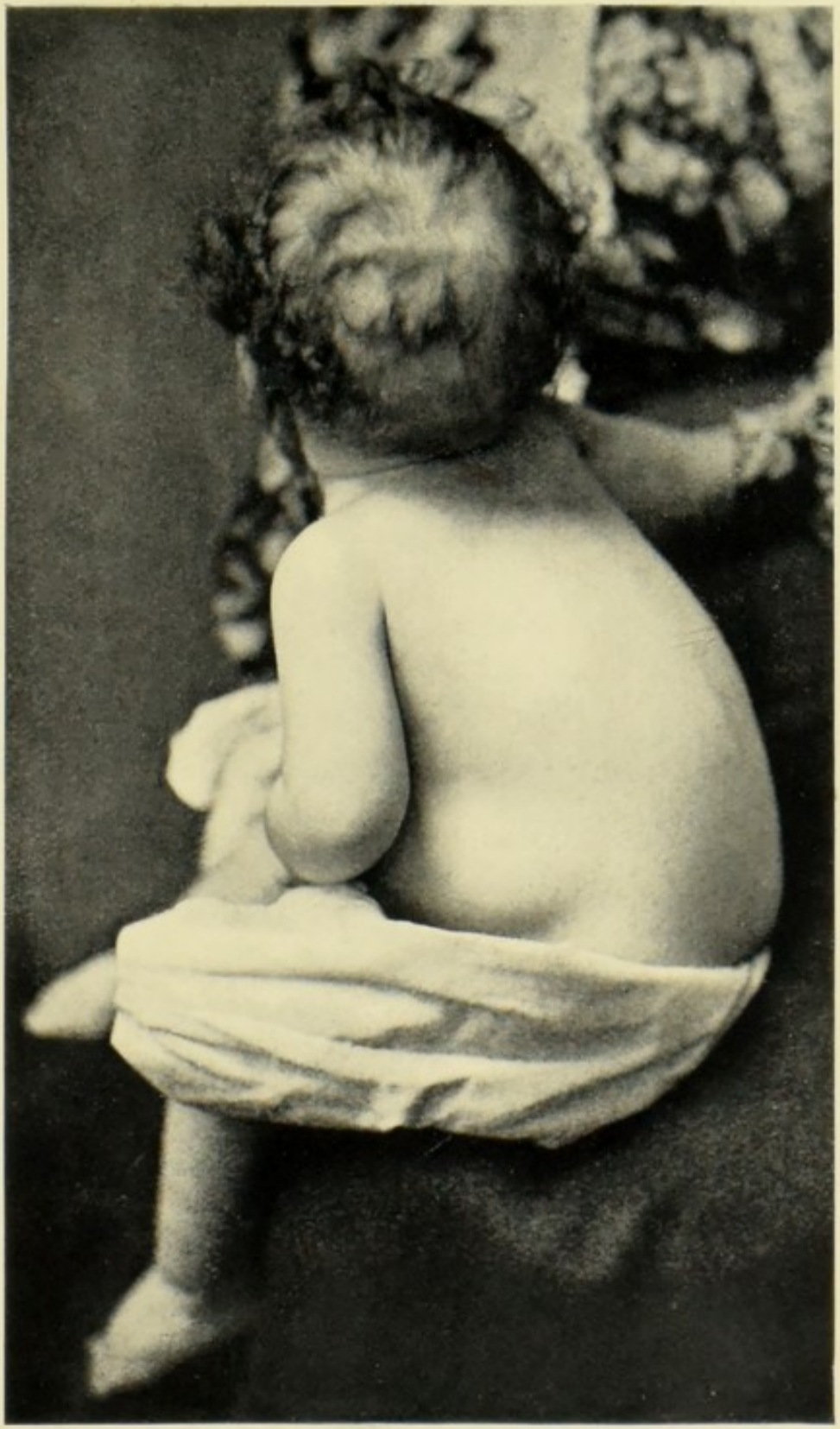


PLATE VI.—Male, æt. 18 months, suffering from Rickets, with typical Curvature of the Spine.

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Once the child has become rachitic he is liable to any one of the many catarrhal conditions which we have already mentioned; of these perhaps the most common are gastro-intestinal catarrh and bronchitis. In other cases nervous conditions are more liable to occur; amongst these is the affection known as laryngismus stridulus, which has been described in another chapter. Another common nervous affection is convulsions. These may be excited reflexly by very slight causes, such as the cutting of a tooth, a slight rise of temperature, or the onset of any acute febrile disease. In all these cases, however, the convulsions are due to the underlying rachitic condition of the child. Tetany, a much rarer condition by far, is sometimes met with in these children. Another nervous phenomenon is nystagmus, which may be a very marked feature of the case. A condition known as facial irritability is likewise a very common symptom. This simply means that when we tap with the finger over the masseter muscle, we produce a reflex contraction of the muscles of the forehead. Head rolling and head banging are also not uncommonly seen during the course of rickets.

Diagnosis.—The disease should always be suspected when an infant is brought to us with a history of gastro-intestinal trouble, and of its having been fed upon some artificial preparation. When the disease has advanced somewhat, the shape of the head, with enlarged fontanelle and perhaps the presence of craniotabes, the keeled sternum and the rickety rosary, the prominent abdomen associated as it may be with enlarged spleen, and the enlargement of the epiphyses, are all characteristic features which cannot possibly be mistaken.

Sometimes it happens that the child who has been fed on artificial preparations presents a well-nourished ap-

pearance, and yet on inquiry we find that it shows no attempt at walking, has possibly no evidence of teeth, while its muscles feel soft and flabby. Such cases are almost certain to turn out to be rachitic. Other cases, again, are brought to us after the child has been making attempts at walking, or it may be at creeping, when we find unmistakable evidences of rachitis in the deformities of the long bones, which have been brought about by these abortive attempts at locomotion.

Prognosis.—Although the majority of cases of this disease make an excellent recovery when seen early and treated properly, there still remain a certain proportion who do not survive the early years of childhood. There can be no doubt whatever that rickets may seriously interfere with the proper development of the child, and when any respiratory disease attacks it there is less likelihood of recovery taking place. In this connection we would specially mention measles and whooping-cough, the prognosis of which is rendered much graver in children who are the subjects of rickets. Nervous complications are likewise unfavourable, while long-continued gastro-intestinal catarrh may undoubtedly prove a serious matter.

Treatment.—The first step in the treatment of rickets is to attend to the feeding of the child. As a rule it will be found that he is having either some artificial food or an improper milk mixture; or it may be that he is being fed at the table with his parents. In any case a suitable diet must be prescribed according to the age of the patient. If vomiting and diarrhœa are present these must be checked. In most cases the administration of powders containing $\frac{1}{4}$ to 1 gr. of hydrarg. subchlor. with $\frac{1}{8}$ to $\frac{1}{2}$ gr. of pulv. ipecac. co. will be found extremely satisfactory.

The next point that must be attended to is to see that

the child has fat given to it in an easily assimilated form; and for this purpose cod-liver oil is usually prescribed. If the ordinary plain oil is given it is well to begin with a dose of 5 to 10 drops, and gradually increase this until 30 drops are taken twice daily, that is to say, after the morning meal and at bedtime. We may also order one of the numerous cod-liver oil emulsions; one of the best being that known as Nutrol, which contains 70 per cent of pure oil, and which we have already referred to in the chapter on infant feeding.

Preparations of malt and cod-liver oil are sometimes employed. They have the advantage of being extremely palatable. We may also refer again to the use of Virol, which is of special value in cases of rickets associated with anæmia. We cannot too strongly condemn the use of petroleum emulsion as a remedy for rickets, as it is absolutely without any therapeutic properties.

In addition to what we have already said, the patient must be allowed abundance of fresh air, not only during the day but also during the night. The clothing must be attended to, as it is specially important to guard such patients against chills. At the same time we would warn against over-coddling, which is so often practised by parents and nurses. Rachitic children are very apt to throw off the bedclothes during the night, and therefore this matter should be attended to, as chills are frequently contracted in this way.

In regulating the diet of rachitic children who are over a year old, we should endeavour to supply as much fat as possible, not only by giving cod-liver oil, or Virol, but also by introducing it into the actual diet of the patient. There are four articles of dietary which are most suited for this purpose, and these are cream, butter, oat-

meal, and eggs. The child should, therefore, have for his morning meal well-boiled oatmeal porridge and cream, and for his midday meal softly boiled, poached, or scrambled eggs, alternated with a little well-mashed potato and mince, or gravy. In the afternoon he may have bread and butter, with milk thickened by the addition of cream. For supper he may have a small amount of arrowroot and milk, or a cupful of milk to which a table-spoonful of Mellin's Food has been added. The important point is to avoid giving much farinaceous food.

When the child has developed distinct rachitic curvature of the lower limbs he should be taken entirely off his feet, and this is best attained by fastening splints to the limbs. These splints must be worn during the day, and removed as soon as the patient has been put to bed.

INFANTILE SCURVY.

This disease is one which produces two very characteristic symptoms, viz., anæmia and tenderness of the limbs. It has been described by Barlow and Cheadle, and cases not uncommonly occur in the course of ordinary practice.

Etiology.—The disease is practically never met with in breast-fed infants. The cause is usually to be found in the fact that the patient has been brought up either on sterilised milk, or on one of the many forms of artificial foods.

It is most frequently met with between the sixth and the eighteenth months. Its association with rickets is a matter of considerable importance. The symptoms of both diseases resemble each other in some points. So much is this the case that the disease is sometimes described under the name of acute rachitis. There can be

no doubt, however, that the two conditions are perfectly distinct, and when we meet with evidences of rickets in a scorbutic patient, these must be looked upon rather in the light of complications.

The exact cause of scorbutus, as it is met with during infancy, is at the present time a matter of considerable dispute. One fact, however, is well known, and that is that milk which has been untreated either by sterilisation or pasteurisation is much less likely to produce this disease than milk which has been so altered. Artificial foods, especially those which are made from dried milk powder, are, when used for a prolonged period, exceedingly liable to produce scorbutus. The same is true of the various forms of condensed milk. All these forms of food evidently lack the essential anti-scorbutic ingredient which is contained in pure fresh milk.

Symptoms.—The child becomes pale and limp. The mother or nurse notes that he screams when he is handled. If the child is walking, he ceases to do so. The limbs become so flaccid that the parent is very apt to suppose that the child is paralysed. In a very short time a localised swelling is noticeable over one or both lower extremities. It may be the knee-joints, or it may be the ankles that are so affected. Not infrequently the swelling occurs in close proximity to the hip-joint. In some cases the upper limbs are also affected, but never to the same extent as the legs. The eyes often show very characteristic evidence of the disease. Either one or both eyeballs may show a certain amount of proptosis. This gives a very distinctive appearance to the face, as the eyes seem to start out of their sockets. In some cases we find distinct extravasation into the ocular conjunctiva. When the child has cut one or more teeth, sponginess of the gums

associated with bleeding may be noticed, but this symptom is never present unless the child possesses some teeth. The anæmia is always a very marked feature of the case. The patient is intensely pale, and this pallor tends to increase as the disease progresses. The chief symptoms, however, are severe pains connected with the bones and profound anæmia. In a few cases nephritis is met with, and in these hæmaturia and albuminuria are usually present.

Diagnosis.—The differential diagnosis is usually a simple enough matter if we carefully examine the patient. The difficulty is in distinguishing this disease from rickets, which presents several apparently similar phenomena. Infantile paralysis is a condition sometimes mistaken for infantile scurvy, but this is usually due to defective physical examination.

Prognosis.—As a rule the ultimate result of the case is recovery. The duration, however, may be somewhat prolonged. Should the anæmia become very profound and progressive death may result; while, should pneumonia or gastro-intestinal trouble supervene, a fatal issue is more likely to occur.

Treatment.—The general treatment consists in attending to the diet of the patient. All artificial foods, condensed and sterilised milks must be absolutely prohibited. The child should be given instead abundance of fresh milk, with an occasional tea-spoonful of raw meat juice, while during the day orange, lemon, and grape juice should be given at intervals. Locally the swellings of the limbs require to be attended to. Cold compresses may be applied, and in all cases movement of the limbs should be rendered impossible, either by the application of splints or by fastening the affected limb to a pillow. It is well to

remember, perhaps, that fractures occur spontaneously with considerable frequency in these cases, and therefore in dressing and in washing the child he should be handled very carefully.

There is no drug which is of much value in this disease, although during convalescence a few grains of ferr. carb. sacch. may be administered, as well as some preparation of cod-liver oil.

CHAPTER VIII

DISEASES OF THE ALIMENTARY SYSTEM.

AFFECTIONS OF THE TONGUE.

Tongue-Tie.—This is a comparatively rare condition, although it is considered very common by nurses and the laity generally. As a matter of fact true tongue-tie is seldom seen. When the frenum is actually short the infant has difficulty in sucking, but very frequently this difficulty is in reality due to the mother's retracted nipples rather than to any abnormality of the infant's frenum linguæ. The treatment is simple, and consists in dividing the frenum with scissors. In some cases this slight operation is followed by considerable hæmorrhage, so that a certain amount of care should be taken in carrying out this otherwise simple procedure.

Ulcer of the Frenum Linguæ.—This condition is occasionally met with in cases of pertussis where the cough is severe. The ulceration is due to irritation of the frenum by the teeth, against which it rubs during the fits of coughing. We have met with similar ulceration in children who were out of condition and suffering especially from gastro-intestinal disorders. A small pustule sometimes forms on the frenum as a result of dental disease, and occasionally the frenum is the seat of extensive

inflammation from the same cause. The ulcer is best treated by the application of silver nitrate.

DENTITION AND ITS DISORDERS.

Children are sometimes born with one or more erupted teeth, and these may interfere with suckling.

The Temporary Teeth.—These are erupted between the 6th and the 30th months, and are twenty in number. The dates of their appearance will be seen on reference to the subjoined table, which is given on the authority of Barrett[1]:—

The 2 lower central incisors,	about	6th	month.
The 2 upper "	"	8th	"
The 2 lower lateral "	"	10th	"
The 2 upper "	"	12th	"
The 4 first molars,	"	16th	"
The 4 canines,	"	20th	"
The 4 second molars,	"	30th	"

The Permanent Teeth.—The dates of their eruption are usually given as follows:—

The 4 first molars,	about 6th year.
The 8 incisors,	about 7th to 9th year.
The 8 bicuspids,	about 10th to 11th year.
The 4 canines,	about 12th year.
The 4 second molars,	about 13th to 15th year.
The 4 wisdom teeth,	about 20th to 25th year.

It is well to remember that 6 teeth should have appeared by the end of the first year, and that all the temporary teeth, 20 in number, should be erupted by the time the child is $2\frac{1}{2}$ years of age.

[1] *Vide op. cit.* London: H. K. Lewis, 1897.

The process of dentition is a physiological one, and should not, therefore, be attended by any disturbing symptoms beyond perhaps slight pain and discomfort. During the process salivation is always a more or less well-marked phenomenon. Beyond this we are not aware of any affection which ought to be set down as due to teething.

Disorders Associated with Dentition.

As we have pointed out, absolutely healthy children have no symptoms during the process. On the other hand badly fed infants, and especially those fed with artificial foods, are frequently, if not always, subject to various disorders.

Very commonly a slight rise of temperature may be noted during the dentition process, the temperature falling as soon as the particular tooth has been erupted. The child, moreover, is fretful and restless. Every child, however, whose temperature is raised should be carefully examined by the medical attendant, and the parent's explanation of the symptoms as being due to teething should not be too readily accepted. The alimentary tract is very often the seat of disturbance during dentition. Thus stomatitis, constipation, diarrhœa, and vomiting may be met with in different cases, and even in the same child at different times. Swollen and tender gums are often present, and we have even noticed suppuration in connection with the process of dentition. Generally speaking, however, these alimentary disturbances are due either to bad feeding and bad hygiene, or to the common and pernicious practice of allowing the child to suck a dirty india-rubber teat.

Bronchitis may occur during the dentition period, but it

is certainly never due to this process which merely weakens the child and renders the soil more capable of engendering pathogenic organisms. The medical attendant who regards such cases of bronchitis as due to teething is certainly on dangerous ground, and is sadly lacking in knowledge. Nasal catarrh may be met with, but this, too, is merely a coincidence. Otorrhœa and earache are very common, and neither is to be looked on as originating in the dentition process. Skin affections, more especially eczema, urticaria, and impetigo, not to mention pediculosis capitis, may occur, but needless to say they are merely coincident with and not due to dentition, although aggravated during the eruption of the teeth.

The connection between teething and convulsions is firmly rooted in the minds of the laity, and apparently no amount of argument will convince them that teething never causes convulsions in any save unhealthy children. As a rule we find convulsions occurring with greatest frequency during dentition in children who are fat and flabby. Rachitis, the result of bad feeding and the use of artificial foods, is of all causes the commonest. The child is, unfortunately, regarded by its parents and friends as a "big, healthy" boy or girl, whereas it is quite the reverse, and liable on the slightest provocation, of which teething takes the first place, to attacks of bronchitis, diarrhœa, and even convulsions. When these occur in infancy it is well to question the mother and nurse as to the feeding of the child, and when the feeding is at fault to correct it at once, otherwise all other treatment will prove futile.

The treatment of all disorders occurring during the dentition period is the same as that adopted when they occur at other times. As a rule it is always well when

there is much fretfulness and restlessness to give a tea-spoonful of ol. ricini occasionally.

Lancing the Gums.—The gum-lancet is an instrument of purely antiquarian interest. It must never be used, even when dentition appears to be difficult. Its employment only serves to increase the liability to sepsis, and the wise physician will never be tempted to scarify the gums.

Delayed Dentition.—Delay in the cutting of the teeth is generally the result of rachitis, and is associated with lateness in closing of the anterior fontanelle and lateness in walking. Its treatment is that of the condition causing it, and in the majority of cases 10 to 15 drops of ol. morrhuæ, given night and morning for a few weeks, will prove beneficial.

The Use of Drugs during Dentition.—We need not refer at length to the all too frequent employment by an ignorant and over-credulous public of the many "infant soothers" in the shape of powders and sedative mixtures. Some of them are distinctly poisonous and fraught with the greatest danger. Grey powder and calomel, moreover, are not to be used indiscriminately, nor is pulv. ipec. co., so often prescribed by physicians, to be regarded as a safe remedy. Where a sedative is really required we have found a powder containing a grain each of sod. brom. and phenazonum of great service, but if these are ordered the parent must be warned not to repeat the prescription save with the medical attendant's express sanction. We are confident that even medical men err in giving drugs far too frequently in such cases, instead of paying heed to the child's feeding and general hygiene.

Toothache.—This is such a common ailment amongst children that it seems to merit a brief consideration here.

Its cause is usually the eating of sweets and pastry. Dental caries is very frequently met with in quite young children, and in not a few instances this is the result of rachitis. Sometimes pain is referred to the ear rather than to the tooth, and it is well to remember that the most frequent cause of earache in young children is a bad tooth. For the treatment of toothache, apart from extraction of the offending tooth, a mouth wash of sod. bicarb. (a tea-spoonful in a cupful of water) is often beneficial. Various applications may be made to the tooth, of which one of the best is pure carbolic acid. Others that may be mentioned are ol. caryophylli, ol. menth. pip., and spt. chloroformi. If, in spite of these simple remedies, the tooth continues to give trouble, a visit to the dentist will in the end be found most satisfactory.

Alveolar Abscess.—Like toothache, gumboils are often met with during childhood. In their treatment external poultices are to be avoided. A saline purge is usually indicated, and sometimes small doses of quin. sulph. (grs. i. to iii.) afford considerable relief. A good old-fashioned remedy is a roasted fig placed in contact with the affected gum. Time and again we have proved its efficacy. Should the abscess show no signs of bursting of itself, a small incision will usually afford speedy relief.

Care of the Teeth.—This is a matter which we fear is sadly neglected in the nursery. Every morning and night the child's teeth should be carefully brushed with a soft india-rubber tooth-brush. Baking soda dissolved in water forms the best lotion for this purpose. Tooth-powders are uniformly to be condemned, at least for children's use. All sweets and pastry must be forbidden, and only good chocolate in small quantities may be allowed as an occasional treat. An annual visit to a good dental

surgeon will be found a safe investment, as early decay may thus be checked and much after-suffering prevented.

We have not referred to irregularities in the teeth, nor to affections associated with the second period of dentition, as these are best studied in special works on dental surgery, and are somewhat outside the scope of a small text-book such as this. It behoves every student and practitioner, however, to pay great attention to the teeth and their disorders, as so much depends upon their integrity and freedom from disease.

STOMATITIS.

Several varieties of stomatitis have been described, but we shall content ourselves with giving a short description of the four most important varieties of this affection.

1. Parasitic Stomatitis or Thrush.

This condition is characterised by the presence of white patches upon the tongue, cheeks, and gums, and is due to a fungus known as the *saccharomyces albicans*. It is extremely common in early life. The cause is undoubtedly want of cleanliness. Common sources of the disease are the nipple of the parent, a dirty feeding-bottle, or the use of a dirty rubber teat, while it is specially prevalent in children who are below par, or the subjects of actual disease. The usual symptoms are evident pain on suckling or feeding, diarrhœa, and sometimes vomiting. The treatment of thrush should be directed to the removal of its cause. Absolute cleanliness of everything that is brought in contact with the patient's mouth must be insisted on. The patches should be frequently painted

with glycerinum acidi borici, and the following prescription ordered :—

℞ Sod. Bicarb. . . . . grs. ii.
Pulv. Rhei . . . . . gr. ss.
Fiat pulv. Mitte tales vi.
Sig.—One to be taken thrice daily.

2. Herpetic Stomatitis.

This variety is otherwise known as aphthous or vesicular stomatitis. In this condition we have at first small vesicles, which after a time become pustular-looking and eventually break down, forming small ulcers. These are often most readily seen on turning down the lower lip when several of them are brought into view. These ulcers are of a dirty-white colour. The cause is somewhat difficult to trace, but usually the alimentary tract is found to be deranged. Pain is always complained of, and the taking of food may be an absolute impossibility. The treatment should consist in giving 1 to 3 grains of hydrarg. subchlor. at the outset, and keeping the child on a diet of milk alone. An alkaline powder, as ordered for cases of thrush (see above), is usually indicated.

3. Ulcerative Stomatitis.

The ulcerative process in this form of stomatitis is found on the mucous membrane at the margin of the gums. It tends to spread to the mucous membrane of the cheeks. Not infrequently ulcers of comparatively large size are met with. Improper food and bad hygiene are the chief causes of this condition, and it is often associated with scorbutus. The patient's breath is foul, and considerable pain, especially on eating and speaking, is complained of. The submaxillary glands are apt to become enlarged and

tender. Treatment consists in careful attention to the diet and general hygiene of the patient. A mouth wash of alum. sulph. (grs. v. : ℥i.) usually affords relief. Tonic treatment is usually advisable, and the following mixture may be prescribed :—

℞ Tr. Nuc. Vom. . . . . ♏xii.
Glycerini . . . . . ℥ii.
Inf. Gent. Co. ad . . . . ℥iss.
Misce. Fiat Mist.
Sig.—℥i. t.d.s. ex aq. p.c.

Potassium chlorate, which is usually regarded as a specific for ulcerative stomatitis, may be tried, but our experience of it has not been very satisfactory.

4. Gangrenous Stomatitis.

The term we have adopted is to be preferred to the older ones of Cancrum Oris and Noma. This affection is one of considerable interest. It is a comparatively rare disease, and when it does occur it usually has a fatal termination. It is most commonly seen as a sequela to measles, though we have noticed it in a case of severe enteric fever. In any case the lesion is brought about by the presence of pathogenic organisms, of which streptococci are said to be the most frequently found. The process starts on the inner aspect of the cheek, usually opposite one of the molar teeth. It spreads very rapidly, and eventually the cheek is eaten through. Then the gangrenous process goes on eating away the tissues in its immediate neighbourhood until a larger or smaller portion of the cheek has been destroyed. The patient's breath has an evil smell, and so has the gangrenous patch itself. The child is greatly prostrated, and the temperature may be very much raised. The heart's action becomes

feeble, and if the patient does not die of exhaustion, pneumonia is very apt to become superadded, and this speedily brings about the death of the sufferer. Pain, however, is seldom a marked feature in this disease. Much may be done by prophylaxis to ward off this terrible affection. Thus the mouth should be carefully washed out during all acute diseases, and the teeth properly attended to. Should gangrenous stomatitis show itself the patch ought to be thoroughly excised, and the parts afterwards cauterised by means of the electric cautery. The patient must be fed at frequent intervals, while stimulants in the form of good brandy and strychnine are always indicated. If we are to avert death in this disease we must act promptly, and treat the local condition very energetically.

DISEASES OF THE ŒSOPHAGUS.

Congenital Stenosis of the Œsophagus.

This condition is usually incompatible with life; still cases have been recorded in which the œsophagus was stenosed and yet the patient survived. The stenosis may occur either at the upper part of the tube or at the cardiac end. As a result of this condition regurgitation of food takes place, and dilatation of the canal above the stenosed portion follows sooner or later. The nutrition of the patient is greatly interfered with, and the unfortunate child is apt to die from starvation. Dilatation of the tube is the only treatment available, unless resort be had to surgical measures, which at the best are not at all hopeful. Much will depend on the degree of stenosis present, and on the skill of the medical attendant.

Cases are recorded in which the œsophagus was absent

altogether, and when this is so there are always other congenital defects present at the same time. At times it is absent in one part of its course, the missing portion being replaced by a band of fibrous tissue.

Œsophagitis.

Inflammation of the œsophagus is a comparatively rare condition. It is usually due to the taking of corrosive substances, such as sulphuric and nitric acids. In these cases we have pain increased on attempts at deglutition, such attempts being apt to produce œsophageal spasm. If the patient recovers stricture is apt to result. The treatment consists in the administration of bismuth and opium, with olive oil in small but frequently repeated doses. Later the stricture requires treatment by dilatation or surgical interference. Occasionally we have *diphtheritic* inflammation of the œsophagus, while *thrush* may be found in the tube as an extension from a similar condition in the mouth. These conditions, however, do not call for any special remark here.

DISEASES OF THE STOMACH.

Acute Gastric Indigestion and Acute Gastritis.

Gastritis.—These two conditions are best considered together as they are often indistinguishable one from the other, at least at the outset. In fact the first may lead on to the second.

Etiology.—The principal cause of these conditions is improper feeding. The error may either be in the quantity or in the quality of the food given. They are more frequently met with in bottle-fed babies. The use of improper feeding-bottles, the lack of care in the feeding itself, or

the giving of a milk mixture unsuited to the child's capacities, will tend to induce acute gastric indigestion. A very common cause, especially amongst the poor, is the giving of "whatever is going" to the child. This phrase includes tea, soup, potatoes, fried fish, and other most indigestible materials. Sometimes the quality of the food is right, but the child is given too much at a time or is fed at irregular intervals. In older children pastry, sweets, and other indigestible articles may induce an attack. Sometimes cold and damp may bring on indigestion, but this is a much less common cause than is improper feeding.

Symptoms.—Pain in the stomach is one of the most characteristic symptoms. In infants we have constant crying and fretfulness, which is somewhat relieved by laying the child on its face. The temperature is usually raised slightly, while in the severer cases the thermometer may register anything between 103° and 105° Fahr. The tongue is coated with a thick white fur. After a longer or shorter interval vomiting occurs. In infants diarrhœa is apt to accompany the other symptoms. In bad cases we find intense depression both of the heart and general circulation as well as of the nervous system. In acute gastritis the symptoms persist, and are apt to be more severe in character than when the case is one of simple indigestion.

Treatment.—At the very outset the stomach must be emptied. To secure this a draught of tepid water should be given, and this should be followed after a short interval by a tea-spoonful of vinum ipecacuanhæ. This will induce vomiting, and so get rid of the undigested material lying in the stomach. For the gastric pain a hot linseed poultice is very soothing, or even the application of hot

flannels. In quite young infants all that may be necessary is to keep the stomach at rest after the patient has vomited of his own accord. In any case no food should be given for some hours, and then only barley water or whey in small quantities. Later milk should be given, but at first it must be very much diluted. It is often extremely difficult to get the parents to understand the importance of what they call "starvation treatment." As some prescription is always looked for it is well to give one, though we cannot say that drugs are absolutely essential. The following, however, will do no harm in such cases :—

℞ Hydrarg. Subchlor. . . . . gr. ss.
Sod. Bicarb. . . . . gr. ii.
Bismuth Subnit. . . . . gr. ii.
Pulv. Cinnam. Co. . . . . gr. i.

Fiat pulv. Mitte tales vi.

Sig.—One to be taken every four hours.

Chronic Indigestion.

This is also known as Chronic Gastric Catarrh. The stomach is usually found on examination to be more or less dilated, and the condition is apt to be associated with intestinal catarrh as well.

Etiology.—Chronic indigestion is usually the result of improper feeding. Apart from the giving of "whatever is going," we have found from experience that even in children who have passed the period of infancy, the use of oatmeal porridge and too many starchy puddings may induce chronic indigestion, which is apt to extend in time to the intestinal canal, unless these articles of diet are cut off. Chronic gastric catarrh is also met with after influenza, scarlatina, whooping-cough, and other infectious fevers, while it is always present in tuberculosis and in rachitis.

Symptoms.—These are very characteristic, although to

the untrained observer they may suggest anything but gastric disturbance. The child is fretful and restless. During the night it sleeps badly, and often wakes up with a start, screaming out as if in an agony of fear. The appetite is often very capricious, but it may be altogether lost. Thirst is usually marked, and slight rises of temperature are very commonly met with. The tongue is coated and the breath foul. Vomiting is a prominent symptom, and is rarely wanting in these cases. Diarrhœa, or it may be constipation, is the usual concomitant. The abdomen is apt to be distended and to stand out prominently.

In infants the stools very often contain the undigested curd of the milk. In older children this phenomenon is, of course, less seldom seen, and constipation is more frequently present than diarrhœa. The symptoms of the condition in older children may closely resemble those seen in adults suffering from the same disease. Loss of appetite, pallor, and decrease in weight are always found to be present in these cases. Such children are usually the subjects of nightmare or night terrors, while during the day they are cross and irritable.

Treatment.—It is a great mistake to imagine that these cases can be cured by drug treatment alone. The first essential is the maintenance of a suitable dietary which must be carefully selected for each individual case, and must never on any account be prescribed indiscriminately. With infants it is the curd of the milk that usually forms the stumbling-block to perfect digestion. Hence it follows that cases of chronic gastric indigestion should be fed on milk which has been greatly diluted, preferably with barley water, as this has, apparently, a beneficial action upon the mucous membrane of the stomach. The value of peptonised milk must not be forgotten, and for this

purpose liquor pepticus may be added in suitable proportions, but it should not be employed for too long a period otherwise the normal activity of the gastric glands becomes seriously interfered with. Fat is sometimes the cause of gastric trouble, and when this is so it should be reduced in amount. It will be found that in some cases even milk, modified in the manner we have indicated, entirely disagrees, and when this is so we must omit it altogether for a time, and feed the child on raw meat juice and beef jelly. When all else fails we must have recourse to some of the artificial foods, but these must never be used for any lengthened period, otherwise the child is sure to become rachitic or, it may be, scorbutic. Some authorities advise lavage of the stomach once a day, or at least every other day, with plain boiled water to which sodii bicarbonas (ʒi. to Oi.) has been added. This we have found to be of some advantage, but it is really unnecessary save in the very worst cases.

In all cases regularity both as to the time of feeding and quantity of food given must be carefully observed. This applies equally to infants and to older children. The latter should not be allowed porridge and starchy foods as these always aggravate the symptoms. So far as drugs are concerned we find minute doses of hydrarg. subchlor., combined with a few grains of sod. bicarb., helpful in some cases. For older children we usually prescribe some such simple mixture as the following :—

℞ Sod. Bicarb. . . . . gr. xxiv.
Glycerini . . . . . ʒii.
Inf. Gent. Co. ad . . . . ʒiss.

S. et M. Fiat mist.

Sig.—ʒi. t.d.s. ex aq. a.c.

A little orange juice is a valuable adjunct to treatment,

and a tea-spoonful may be given once or twice a day between meals even to infants over six months.

CONGENITAL HYPERTROPHIC STENOSIS OF THE PYLORUS.

This is a subject which has received little or no attention from writers on children's diseases, partly because it was formerly regarded as an absolutely fatal condition, and partly also because it was looked on as being exceedingly rare. Thanks to recent work we now know differently, and, consequently, we feel in duty bound to refer to the condition at some length.

Morbid Anatomy.—The condition is one of increase in the muscle fibres which surround the pylorus. The pylorus thus becomes greatly thickened and hypertrophied, especially at its distal extremity. This thickening usually extends for about an inch. In the words of Cawtley, who has recently recorded several cases of this abnormality, "the thickening is most marked at the duodenal end, and thins off towards the stomach. Looked at from the stomach side, the pylorus is funnel-shaped. The stenosis is not complete, for it is easy to pass a probe through. For practical purposes it may be regarded as complete in many cases, for the mucous membrane is thrown into folds by the contraction of the circular muscular fibres, or into one large fold which stands out, when the pylorus is laid open, like the verumontanum in the prostate. These folds of mucous membrane complete the obstruction during life. The degree of stenosis after death depends partly on post-mortem contraction, and is no measure of the stenosis during life."

Pathology.—Thomson regards the condition as due to "functional disorder of the nerves of the stomach and

pylorus, leading to ill-coordinated and therefore antagonistic action of their muscular development." It seems unnecessary to go so far out of the way to explain the pathogenesis of what is probably a much more easily explained condition. Is it not simply an error in development whereby the musculature of the pylorus has been excessively formed? This is the opinion of at least one authority, and we are inclined to accept it.

Symptoms.—The symptoms do not usually present themselves until some days after birth. All observers are agreed that the most prominent symptom is vomiting. The most important sign is thickening of the pyloric ring, which can usually be palpated slightly to the right of and above the umbilicus. This, however, may not be felt even on careful examination, and then the condition cannot be diagnosed so certainly. In addition there is usually dilatation of the stomach present, and then we may be able to note the characteristic peristaltic waves passing from left to right; these, however, may not be visible on all occasions, and accordingly repeated examination of the patient should be made. As a rule constipation is present, though in some cases diarrhœa is a prominent feature. The constipation and vomiting are apt to lead to a diagnosis of intestinal obstruction being made, but careful physical examination should enable the physician to exclude this possibility. The vomiting, which is usually, though by no means always, the cardinal symptom, tends to become more and more marked as time goes on. The child rapidly loses weight, and becomes pale and emaciated.

Prognosis.—Without treatment the case is practically hopeless, though it is probable that many cases of pyloric stenosis met with in adults are but aggravations of an earlier congenital condition. Everything depends on

early recognition of the condition and the adoption of very active treatment.

Treatment.—While rectal feeding may be employed it is not likely that the patient's life can be prolonged for any length of time by this means. As soon as the physician has made up his mind as to the correct diagnosis surgical aid should be summoned. The choice of operation lies between gastro-enterostomy, pyloroplasty, and stretching of the pylorus. Up to the present pyloroplasty is the operation most commended by those who have had any experience of this condition. A longitudinal incision is made through the thickened pylorus. At the upper and lower ends of the incision the mucous membrane is united to stomach and duodenum in turn. After the operation the patient is fed on peptonised milk considerably diluted. Diarrhœa is not infrequent as a sequela to operation, but is usually readily amenable to treatment. The success of operation largely depends on its early performance, before the child has become too feeble and emaciated to stand the shock attendant upon the anæsthetic state and the operative procedure itself. Every day that passes certainly lessens materially the surgeon's chances of success.

DILATATION OF THE STOMACH (GASTRECTASIS).

This is defined by the late Dr. Wm. Pepper as an "abnormally large size of stomach which is accompanied by inability to propel its contents into the intestine within the physiological limit of time and of muscular effort." This definition cannot be improved on, as it brings into prominence the double condition which exists in such cases.

Etiology.—Dilatation of the stomach may result from *Pyloric Stenosis,* which may not only be due to a congenital hypertrophic condition of the orifice, but also to the action of corrosives, to ulceration, which is sometimes met with even in quite young children, to pyloro-spasm the result of gastric hyperacidity, and even in some instances to malignant disease, though this is far from being a usual factor in its causation.

Then, again, *Atony of the stomach* may give rise to dilatation of the viscus. The causes of atony are very numerous, and it is only necessary to enumerate those most frequently met with in practice. These are overfeeding and improper feeding, rachitis, fevers, including acute rheumatism and pneumonia (in the latter condition it often results from overfeeding during the course of the disease), repeated attacks of indigestion, and generally speaking anything which throws too much work upon the gastric tissues.

Symptoms.—Anæmia and progressive emaciation are very typical of this condition, as are also sluggishness of the bowels and general languor. A bright, active child will rapidly show signs of fretfulness and disinclination to play with his toys. The tongue becomes dry and coated with a dirty thick fur. The breath has a disagreeable odour, and thirst is often extreme. The appetite is always poor, and there is usually considerable discomfort after meals. Vomiting is often, but not always, attendant on this condition, but it is usually present in cases of long standing. Tetany in relation to gastric dilatation is a subject of considerable interest, and we favour the view held by Moynihan, that the association of tetany with gastrectasis is much more common than is generally supposed. We have personally recorded a very interest-

ing case in which it occurred in connection with gastric carcinoma[1]; and we have certainly seen it in two cases in children, one of pertussis complicated with broncho-pneumonia where the patient had a dilated stomach as the result of improper feeding, and again in a case of rachitis in which the patient's stomach was enormously enlarged.

Physical Signs.—On inspection the abdomen appears distended, more particularly toward the left hypochondriac and the epigastric regions. Peristaltic waves are often visible, and these travel from left to right. We have already referred to these in connection with gastrectasis consequent upon congenital hypertrophic stenosis of the pylorus (*vide* p. 124). Succussion of the stomach, if too much reliance is not placed on it, is of service in diagnosis; but it is well to bear in mind that splashing is not always due to gastrectasis, and that the stomach may be greatly dilated without splashing being elicited on palpation. Percussion alone is not nearly of so great diagnostic value as auscultatory percussion. This was brought prominently before the profession some time ago by R. A. Fleming, who wrote with regard to its value in adult patients. We have found that it is of even greater service in young subjects, and by constant practice one is soon able to become an adept at the art. The method of diagnosis sometimes employed by means of inflation is not, in our opinion, generally applicable to children, and certainly not at all to the youngest subjects who are most frequently affected with gastrectasis.

Prognosis.—On the whole we should say this is very favourable, provided suitable treatment is employed. Much, of course, will depend on the etiological factor

[1] Vide *The Practitioner*, Dec. 1903.

present in any given case. As we have already pointed out, gastrectasis which results from congenital pyloric stenosis must no longer be regarded as incurable and therefore hopeless.

Treatment.—The cause of the condition must first be sought for, and if possible removed. Thus in congenital stenosis of the pylorus, the operation of pyloroplasty should on all occasions be early resorted to. Otherwise the treatment of gastrectasis must be conducted on certain definite principles.

(1) *The general hygiene of the child must be attended to.* This implies fresh air and cleanliness of skin and clothing. If necessary change of air must be sought in the country or by the sea coast; and this is of special importance where the condition has resulted from some acute illness such as pneumonia, or any of the infectious fevers. The clothing should be warm and light, as neglect of this matter may retard the child's recovery.

(2) *Means must be employed to tone up the child's system generally.* For this purpose nothing can equal cold douching. The child should stand in a bath of hot water before the nursery fire while the nurse douches the spine and abdomen with tepid or (for older children) with cold water from a sponge. The process need not occupy more than a few minutes, after which the child should be well rubbed down with a moderately rough towel.

(3) *Tonics should be given which will increase the activity of the gastric musculature.* Strychnine, nux vomica, and bitter tinctures and infusions are often of great value, but only as aids to other treatment. These also not infrequently relieve the constipation which is apt to prove a very troublesome symptom in these cases. The following typical prescriptions are merely given for the guidance of

the reader. Doubtless other combinations will suggest themselves:—

℞ Liquoris Strychninæ Hydrochloridi . ♏vi.
Acidi Hydrochlorici diluti . . ♏xii.
Tincturæ Aurantii . . . . ♏xxiv.
Glycerini . . . . . ℥ii.
Aquæ Destillatæ ad . . . . ℥iss.
Misce. Fiat Mist.

Sig.—A tea-spoonful to be taken in a little water after meals.

℞ Tincturæ Nucis Vomicæ . . . ♏xii.
Glycerini . . . . . ℥ii.
Infusi Gentianæ Compositi ad . . ℥iss.
Misce. Fiat Mist.

Sig.—A tea-spoonful to be taken in water before meals.

℞ Tincturæ Cinchonæ . . . . ℥i.
Tincturæ Cinnamomi . . . . ℥i.
Glycerini, vel Syrupi Aurantii . . ℥ii.
Aquæ Destillatæ ad . . . . ℥iss.
Misce. Fiat Mist.

Sig.—A tea-spoonful to be taken in water before meals.

We are particularly fond of one or other of the bitter tinctures in the treatment of gastric dilatation, the great difficulty of their administration being in disguising their disagreeable taste. They not only tone up the stomach, but they stimulate the patient's appetite. As regards antiseptics we have little to say, as we look on these as of very little value indeed in the case of children. In fact, we have not infrequently known them to aggravate the condition by producing nausea and vomiting. Personally we regard the first mentioned prescription as being of considerable service as an antiseptic since it contains hydrochloric acid and strychnine.

(4) *Constipation requires attention* as, though this is often the result of the gastric condition, by its very persistence

it is apt to aggravate and still further augment the dilatation of the stomach. Constipation in such cases is best relieved by glycerine suppositories and not by medicines given by the mouth. Regular daily massage of the colon is a means of relieving constipation which often succeeds when other more commonly adopted means of treatment fail to give relief.

(5) *The Diet of the Patient must be most particularly attended to.* We have left the consideration of the feeding of the patient last, not because we deem it to be of less value than the other points we have referred to, but because we wish to specially emphasise its importance. These cases will tax the physician's skill to the utmost in order to find out a suitable daily dietary for them. Too much fluid has to be avoided, and yet milk is, as a rule, a necessary article of dietary, at least in the case of young children. Thirst is often a prominent symptom, but too much water will aggravate the condition under treatment. These are some of the difficulties which meet the practitioner when face to face with a case of gastrectasis occurring in childhood. Rectal feeding has often to be resorted to, but we would point out that this mode of nourishing a child is by no means to be relied on. In all cases the key to successful dieting is to give small quantities at frequent intervals. Even for infants raw meat juice and beef or chicken jelly are often better borne than milk, and certainly for older children they are admirable means of support. Albumen water, to which a few drops of pale brandy have been previously added, is useful as an occasional drink. Thirst may sometimes be relieved by giving a tea-spoonful of orange or lemon juice occasionally; this is better than giving water enemata which only tend to disturb the fretful and irritable patient still further.

Rest in bed is often a valuable adjunct to the dietetic treatment, and in every case we certainly think the patient should lie quietly in his crib or bed after each meal. As a rule nothing should be given at night after 6 p.m., unless it be a dry biscuit in the case of older children, or a table-spoonful of diluted milk in the case of infants.

HÆMATEMESIS.

This is practically only a symptom, but one of immense importance owing to the fact that children bear loss of blood very badly indeed.

Etiology.—This condition may be met with in the morbus hæmorrhagicus of the newly born. It may also be met with in cases of gastric ulceration, the ulcers being exceedingly minute as a rule. Again, it may result from cardiac lesions, and in cases of portal obstruction it frequently occurs. Purpura and scorbutus may give rise to it, and in hysterical patients it is occasionally encountered.

Nature of the Hæmorrhage.—The blood is, as the name of the condition signifies, vomited, but bleeding may occur into the stomach; in other words, the hæmorrhage may be concealed. At other times we find the hæmorrhage makes its way downwards and the blood escapes per rectum. In making up our mind as to the source of the hæmorrhage we must always remember that blood swallowed may be vomited. Infants are frequently said to be the subjects of gastric disease, whereas the hæmatemesis in their case may be simply due to their sucking blood from nipples which are fissured and cracked.

Treatment.—This may be summed up in a few words, Sol. adrenalin chlor. is one of the most reliable remedies

for this condition that we at present possess, and should always be given a fair trial. Although it has a tendency to raise the blood pressure it must be remembered that it has a powerful astringent effect upon mucous surfaces. All mouth feeding must be stopped, and even water must be withheld, as during the process of its absorption by the stomach that organ is kept in a state of unrest. Rectal alimentation becomes an absolute necessity, and in most cases hæmatemesis is a grave condition, not only because rectal feeding is not well suited to the needs of children, but also because young patients are unfavourably influenced by hæmorrhage.

EMESIS.

Vomiting is a symptom of many diseased conditions, and as it is so frequently met with in practice under quite a variety of circumstances we cannot do better than consider it separately.

Etiology.—It is, perhaps, impossible in a small volume such as this to give anything like a complete list of the causes that produce vomiting in infancy and childhood but those mentioned are beyond doubt the most important to bear in mind. We shall endeavour to group them under definite headings, as thereby we will be enabled to classify them more clearly.

1. Gastric Conditions.—In infants we not infrequently meet with a simple regurgitation of the food taken. This occurs painlessly and without effort. It results either from over-richness of the food material, or from too rapid or over-feeding. In other cases the vomiting is the result of a disordered stomach which is not properly performing its functions. Congenital hypertrophic stenosis of the pylorus must be kept in mind, and also

gastric dilatation, as causes of vomiting in infants and children.

2. **Intestinal Conditions.**—Peritonitis, appendicitis, and intussusception are the three most important of these. It is well also to remember that in cases of severe diarrhœa vomiting is always a marked symptom, and is to some extent a measure of the severity of the case.

3. **Cerebral Conditions.**—Under this heading we would place meningitis first. This may be either simple or tuberculous. Cerebral tumour and abscess must also be kept in view.

4. **Renal Conditions.**—Vomiting is a common symptom in acute nephritis, and also in the uræmic state, and an examination of the urine may clear up the diagnosis when the cause of the vomiting is not otherwise apparent.

5. **Acute Febrile Conditions.**—Scarlatina is almost invariably associated with vomiting at the outset, while in pneumonia this symptom is often one of the first to attract the parent's attention. In pertussis vomiting is very common, but here it is to be regarded as a reflex act following upon the spasms of coughing.

6. **Reflex Conditions.**—Vomiting is certainly associated with the presence of intestinal parasites, and may occur during the period of dentition. Aural and pharyngeal irritation may also lead to vomiting. It is also met with in children who are the subjects of severe cough, a fit of coughing often terminating with them in vomiting, a matter of great importance, as thereby the bronchial tubes are emptied, to a large extent, of their contents.

7. **Hysterical Vomiting.**—This is certainly met with, even in quite young children, and is often very troublesome. Under this head we would include vomiting due to fright and other mental conditions.

8. **Poisons.**—These are a well-known cause of vomiting in childhood. Tobacco may produce it in boys, and this should be remembered as a cause. Sweetmeats are a frequent source of vomiting, and deserve to be mentioned under this group.

9. **Cyclic or Recurrent Vomiting.**—This condition has long been recognised as being especially peculiar to childhood. Children affected with this somewhat anomalous condition are subject to attacks of vomiting which recur at very irregular intervals. The explanation of the condition is not quite a simple matter, but we personally regard it as allied to migraine, and Holt maintains that it is the result of a uric-acid diathesis. This theory is borne out by the results of treatment along these lines.

Symptoms.—A case of the kind lately under our care may be outlined, as it presents in a fairly typical manner the characteristic symptoms of recurrent vomiting. The patient was a boy æt. 5 years. He had always been a healthy child, though he had a mild attack of measles at the age of two and a half. He was bright and active as a rule, but at times was cross and irritable. When about four years of age he began to have attacks of vomiting which his parents said came on about every six weeks. Recently he had been much troubled with constipation, and his breath was said to have a very bad smell. The vomiting always lasted for about two days, and during that time the child was listless and apathetic, and when spoken to was cross and fretful. When we saw him he was lying in bed evidently in pain. He complained when his abdomen was palpated. His tongue was fairly clean, and his breath had no peculiar odour. His temperature in the groin was 100° Fahr., his pulse was small and feeble, and the urine when examined was found

to be very acid, but contained no abnormal constituent. He had been vomiting during the night and would not take food of any kind, though he cried for water as he was evidently very thirsty. He was ordered three grains of hydrarg. subchlor., and a mixture containing as the principal ingredient 3-grain doses of sod. brom. He was also given a hot bath to favour elimination by the skin. Next morning he was quite better, and would have eaten ravenously had he been allowed to do so, but he was kept strictly to milk. Afterwards he was put on a diet as recommended below, and since then he has not had another attack.

Treatment.—If we are sure that the case is one of recurrent vomiting, then, whether the bowels are constipated or not, a dose of hydrarg. subchlor. should be given at once. Small doses of sod. brom. are excellent, and if thought desirable a few grains of sod. salicyl. may frequently be added with advantage. The diet should consist of milk, fish, and chicken. No pastry, sweets, tea, or coffee must be allowed. Coffee, we may mention in passing, only serves to aggravate the condition, a fact perhaps not sufficiently recognised. The urine should always be carefully examined, and, if specially acid, steps should be taken to reduce its acidity by the exhibition of alkaline remedies or the use of soda or of Vichy water.

DISEASES OF THE INTESTINES.

Acute Intestinal Indigestion.

This condition may complicate gastric indigestion or may occur alone. Very frequently we find the gastric symptoms already referred to (*vide* p. 119) present as well.

Etiology.—Improper feeding is the principal cause, as it is in acute gastric indigestion. Chilling of the surface, however, is a very common cause, especially in infants. It is, perhaps, most frequently met with in warm weather, but this statement must not lead the reader to confuse this comparatively simple ailment with the more serious one, namely, Summer Diarrhœa, which we shall have to consider later.

Symptoms.—Diarrhœa is the most prominent symptom, and the patient is usually brought to the physician on this account. Associated with the diarrhœa is colic which may be pretty severe. The temperature is usually slightly raised, and in some cases, particularly in young infants, it may be fairly high. There is usually a certain amount of feebleness present, and the child's appearance is often typical, with somewhat sunken eyes and dark rings encircling them. In infants the stools when inspected are found to be green, an appearance which is exceedingly characteristic. Their sour smell is often noted by the parent or nurse, while at other times a disagreeable odour is felt. On careful and closer inspection undigested food material will be found present in considerable amount. This condition, if taken in hand timeously, rarely gives rise to much anxiety, but if it is neglected, and especially when it comes on during the hot season, it may lead to a much more serious condition. In any case, if the diarrhœa is at all severe, vomiting is sure to supervene.

Treatment.—The first essential to successful treatment is to empty the intestinal canal of all its irritating contents. This is most speedily accomplished by giving the patient a dose of castor oil. If this is objected to a dose of hydrarg. subchlor. will be found quite efficacious, provided the dose given is large enough. Most practi-

tioners err in administering this drug in too small quantities. The amount given may vary from ½ to 3 grains according to the age and size of the child. After the bowels have been very thoroughly evacuated by one or other of these drugs any of the following prescriptions should be ordered:—

℞ Pulv. Ipec. Co. . . . . gr. ¼.
Pulv. Zingiberis . . . . gr. ¼.
Bismuth. Carb. . . . . grs. iiss.
Fiat Pulv. Mitte tales iv. (vel vi.)
Sig.—One to be taken twice (or three times) daily.

℞ Salol . . . . . gr. i.
Pulv. Cretæ Aromat. . . . . gr. i.
Fiat Pulv. Mitte tales vi.
Sig.—One to be taken thrice daily.

℞ Pulv. Cretæ Aromat. c. Opio . . gr. ss.
Bismuth. Carb. . . . . grs. iiss.
Fiat Pulv. Mitte tales vi.
Sig.—One to be taken thrice daily.

For the colic nothing is so soothing as a large linseed poultice applied over the abdomen, and in some cases a few drops of brandy well diluted will be found an excellent remedy.

The feeding has to be strictly attended to, otherwise medicines will be of little or no avail. All milk must be withheld for at least forty-eight hours, and in the interval nothing but barley water and plain water (previously boiled and cooled) should be given. When milk is recommenced it must be administered in a very dilute condition, and it is often advantageous to give it peptonised. Sometimes we have found the addition of a tea-spoonful of one of the malted foods to each meal of

value in such cases, but this must not be continued indefinitely. The artificial food must always be regarded as a crutch to be laid aside at the earliest possible opportunity. In the case of older children the diet demands the same care as in infancy, and nothing likely to aggravate the symptoms or to lead to their recurrence must be given to the child.

Chronic Intestinal Indigestion.

This is an extremely important subject, as the symptoms produced by this condition, especially when it occurs in older children, are apt to prove very misleading to anyone who has not made a special study of it. We shall specially devote our attention to the consideration of this condition as it is met with in older children, incidentally referring to its symptoms and management when it occurs during the period of infancy.

Etiology.—Having devoted considerable attention to the subject we are able to state that it is far more commonly met with in children who are regularly fed on porridge than in those who are not. In fact, we might almost say that this is essentially the cause of the condition. Too much starchy food, however, has the same effect; and in this connection we would specially point out the error of giving young children too much corn-flour and other similar starchy foods. Potatoes are, in our opinion, not nearly so harmful, though if taken in excess they certainly lead to intestinal dyspepsia. Another frequent cause is the eating of "pieces" between meals.

In infants the condition is usually the result of feeding on artificial preparations, which are undoubtedly harmful when prescribed by parents for their children without medical advice. Other causes at work may be the use of

an improper milk mixture, or some defect in the mother's own milk.

Symptoms.—In children over a year old we have a symptom-group which is very often presented to the medical practitioner. The young patient is cross and irritable, and may be restless during the day, but not infrequently is listless and drowsy. At night he is always restless, sleeping fitfully and starting up at times with a cry of terror. The pillow is often wet with perspiration when the child is lifted out of his crib. The parent often makes the suggestion that the child "has worms," from the fact that he is constantly grinding his teeth and picking at his nose. Constipation or diarrhœa with or without vomiting is present. The motions have always an evil odour. The child takes little or no food, but at times will eat articles of diet which are not at all suitable, such as salt-fish and (in one case recently under our care) raw carrots.

When the patient is brought before the physician the one thing that strikes the eye at once is the prominent abdomen. The big, tympanitic abdomen always stands out in bold relief against the otherwise thin and more or less emaciated face and body. The tongue may be fairly clean, but often is extremely foul. The axillary temperature will usually be found slightly above the normal, and as these children often have a harsh, dry cough the feverishness may be erroneously attributed to some chest condition which does not actually exist. In some cases urticaria is present, while not a few present symptoms which are not incompatible with a diagnosis of meningitis.

In infants the symptoms do not form such a striking group. Diarrhœa, or it may be constipation, is present, the stools in the former case being greenish and containing undigested food material, while in the latter they are

lacking in colouring matter, and are apt to be somewhat like putty when passed, though at other times they form hard, rounded masses of small size. The infant gradually loses weight and becomes considerably emaciated.

There is a special variety of chronic intestinal indigestion which must be briefly referred to, namely, *Mucous Disease.* This was the term applied to it by Eustace Smith, and is the one by which it has come to be universally known. In this disease the symptoms are practically the same as in the ordinary form of chronic intestinal indigestion detailed above. The chief differences are as follows:—

1. The tongue has a more or less slimy coating of mucus, or it may present a glossy appearance.

2. The motions are always covered with mucus.

3. The child is subject to sudden attacks of facial pallor which are a marked feature of such cases.

4. Pain in the side is often complained of.

5. Cervical glandular enlargement is not at all uncommon, suppuration being very rare in such cases.

6. Pyrexia is stated to be absent, the limbs and more especially the hands and feet being cold and clammy.

7. Day-drowsiness and night-restlessness are more marked, and attacks of nightmare are generally met with in these cases. Somnambulism is, in our experience, fairly common.

Diagnosis.—Care must be taken not to mistake chronic intestinal indigestion for cerebral disease. It is very apt to be mistaken for meningitis on account of the drowsiness, constipation, and vomiting (sometimes present), as well as the rise of temperature and nervous symptoms. It is only by careful examination and inquiry into the minutest details of the patient's history that we can hope to arrive

at a correct diagnosis. Above all things the practitioner should never hazard an opinion without actually seeing the abdomen, which is always characteristically protuberant in chronic intestinal indigestion. If cough is present this is generally reflex, but careful examination of the throat and chest will decide this point. If the child is restless at night, grinds his teeth while asleep, and has a capricious appetite, the diagnosis of worms may suggest a possible explanation of the symptoms; but their presence should never be guessed at until we have excluded other more important conditions.

Prognosis.—The prognosis depends entirely on the skill of the medical attendant, and the care with which his instructions are carried out. Children suffering from this affection run greater risks should other diseases, such as one of the exanthemata, attack them. Pneumonia is also at times a cause of death in infants who are the subjects of intestinal indigestion. Apart from this it may lead to serious intestinal lesions, such as inflammation and ulceration, which may greatly endanger the patient's life.

Treatment.—Everything must give place to dietetic treatment in the management of these cases. In cases occurring during the period of infancy, the milk must be modified in accordance with the digestive powers of the patient. Both proteid and fat may require attention. Dilution with barley water is often of advantage, and in some instances peptonisation of the milk is helpful. Raw meat juice or beef jelly is a valuable addition to the dietary in these cases, and so is albumen water. Whey, we have found from experience, suits many of these cases when everything else disagrees.

In older children likewise the diet must receive the most careful attention of the physician. Porridge, starchy

foods, and "pieces" must be absolutely forbidden. The patient must be put on milk, with an occasional tea-spoonful of beef or chicken jelly for variety. If the milk disagrees it may be given diluted with warm water, or it may be given peptonised. Sometimes we find the addition of a tea-spoonful of one of the malted foods of service, and in the case of children over one year of age their use is quite allowable, even for a prolonged period. An occasional water biscuit may be given after a time. When improvement becomes evident, as it usually does by the child resting more quietly during the night, eggs and chicken soup may be added to the dietary. Only by easy stages should the child be given an ordinary diet, and as a rule it is wise to abstain altogether from the use of porridge and too many starchy puddings. Irregular meals must on no account be sanctioned.

Drugs are of value in this condition, and the most useful of all is undoubtedly hydrarg. subchlor. Where there is constipation from 2 to 3 grains may be given at the start, and later an occasional dose of 2 grains may be administered. Even where there is diarrhœa we can advise its adoption if given combined with bismuth as under:—

℞ Hydrarg. Subchlor. . . . . gr. ss.
Bismuth. Carb. . . . . grs. iiiss.
Fiat pulv. Mitte tales vi.
Sig.—One to be taken morning and evening.

When the child is somewhat improved he should always be given some such tonic as the following:—

℞ Sod. Bicarb. . . . . grs. xxiv.
Tinct. Nuc. Vom. . . . . ♏xii.
Glycerini. . . . . ʒii.
Aq. Dest. ad . . . . . ʒiss.
Misce. Fiat Mist.
Sig.—ʒi. t.d.s. ex aq. ante cib.

In the treatment of mucous disease the same general rules must be attended to. In addition the use of decoct. aloes co., as recommended by Eustace Smith, can be recommended. It should be administered in drachm doses thrice daily, but the preparation must be a reliable one, otherwise it will do more harm than good. It should be given immediately after meals.

In all cases attention to the hygiene and clothing of the child is necessary. Fresh air and warm clothing (especially of the abdomen and lower limbs) are most important essentials in the treatment of chronic intestinal indigestion. Massage of the abdomen with olive oil is often found of service, especially after the child has been bathed. The patient should be sponged all over every morning, and have a hot bath at bedtime. In the case of older children we are in the habit of ordering the spine to be douched after the morning bath with a view to bracing up the child's system generally.

These cases are often very troublesome, and it is only by the greatest patience on the part of the medical attendant and the parents that success can be achieved. Frequently these children find their way to the out-patient departments of our hospitals either because the condition has not been recognised, or because when diagnosed the parents have not carried out the treatment suggested by the physician.

Summer Diarrhœa.

A great many terms have been applied to this affection, such as Acute Gastro-Enteric Infection and Infectious Diarrhœa. Infective Gastro-Intestinal Catarrh is the name we prefer to use in speaking of it, but we have here adopted the term Summer Diarrhœa, because it seems to us sufficiently explicit for our present purpose.

Etiology.—As its name implies this is a disease which is confined to the summer months. It is especially a disease of cities rather than of rural districts. It is certainly far more prevalent among bottle-fed babies than among breast-fed nurslings. No doubt it is due to organismal infection as it is certainly, to some extent at least, an infectious disease, and one which may become epidemic. This is an important point to remember in regard to prophylaxis. Children living under bad hygienic surroundings, whose clothes are allowed to become soiled, and whose skins are kept in a filthy condition, are far more liable to this affection than those who are in the habit of being bathed every day. Still, the real cause of the disease is as yet uncertain. In all probability the tone of the patient is lowered by the conditions under which he lives, and the ingestion of milk laden with toxins, generated by a variety of micro-organisms contained in it, accomplishes the rest. In any case it is inadvisable to employ the term cholera infantum in such cases, as this disease, though not necessarily separable on bacteriological grounds, possesses in many respects quite distinct clinical manifestations.

Symptoms.—The milder cases of this disease are often allowed to escape attention. There is nothing beyond a little diarrhœa and slight indisposition which are usually attributed to teething, cold, or to anything but the real cause. The symptoms, however, are apt to progress. The diarrhœa becomes more marked until in a few days vomiting is apt to supervene, and the little patient becomes strikingly emaciated. The temperature is often slightly elevated. In the more severe cases the onset is quite sudden with rise of temperature, vomiting, marked thirst, and restlessness. At times convulsions occur, or

the patient may become collapsed with feeble pulse and pale face. Presently the typical phenomenon of diarrhœa comes into prominence. The stools are always extremely fœtid, and vary in colour. Thus they may be yellowish, greenish, or somewhat brown in appearance. There is always a considerable amount of undigested material present, and their odour, as already mentioned, is always extremely disagreeable. They are, moreover, very acrid and irritating, and may give rise to erythema in the neighbourhood of the anus. The infant suffers from intestinal colic which is relieved by the passage of a stool accompanied by a large amount of flatus. This is extremely typical and quite diagnostic. The child rapidly emaciates. The pulse becomes weaker day by day. Nothing given by the mouth is retained, and unless relief is obtained death will ensue from convulsions, stupor, and coma, or from broncho-pneumonia.

Diagnosis.—We have known these cases to be mistaken at first for simple intestinal indigestion, and even for intussusception. Attention to the train of symptoms renders mistake in diagnosis almost impossible. Diarrhœa occurring in infants during the hot season should always suggest an infective condition to the physician's mind.

Prognosis.—Unfortunately many infant lives are sacrificed every year owing to this disease. Everything depends upon our ability to place the child under satisfactory hygienic conditions, and on the care with which our instructions are carried out by the parent. In otherwise unhealthy and rachitic subjects summer diarrhœa becomes a very fatal disease.

Treatment.—Much may be done by prophylaxis to prevent the onset of this disease. It would take up too much space were we to go into this matter in detail.

Accordingly we have formulated a few rules which will serve as guides, and which may be expanded by the reader at his leisure.

(1) As summer diarrhœa is seldom met with in breast-fed babies every woman should be made to nurse her own child, unless under very exceptional circumstances.

(2) Overfeeding should always be avoided in summer, and small quantities of water should be given frequently which has been boiled, and cooled in bottles sealed up with cotton wool and kept on ice. If bottle fed, no rubber tubes must be allowed.

(3) The abdomen should be kept warm by means of a flannel binder, while the rest of the body should be clad in warm but very light garments.

(4) Fresh air and frequent bathing must always be enjoined.

(5) Soiled diapers must be immediately and thoroughly disinfected by boiling.

(6) All milk given to infants during warm weather must not only be previously sterilised, but kept in this condition, unless of course breast-feeding be adopted.

Once the condition has developed curative treatment must be adopted, although attention to the foregoing rules is still necessary. All milk must be absolutely and instantly cut off. The only food allowable is barley water in small amounts at regular intervals. This may have to be continued for several days. Later albumen water may be fed to the patient, or if preferred white of egg and barley water may be given instead. It is often advisable to add a few drops of brandy on each occasion. When milk feeding is resumed the milk must be given greatly diluted, or peptonisation may be resorted to for a time. We have often succeeded in these difficult cases, when

all acute symptoms had ceased and yet milk continued to disagree, by substituting whey and beef jelly.

Drugs are of some service in this disease, more especially castor oil and hydrarg. subchlor. The latter is our favourite. In severe cases where the symptoms are urgent we must not wait for such drugs as these to clear out the intestinal canal. We must effect this at once by means of intestinal irrigation with saline solution. When the gastro-intestinal canal has been thoroughly cleared out the following powder may be given, as it not only relieves the colicky pain, but also helps to soothe the irritated mucous surface :—

℞ Hydrarg. c. Creta . . . . gr. ¼.
Pulv. Ipec. Co. . . . . gr. ¼.
Bismuth. Carb. . . . . grs. iiss.

Fiat pulv. Mitte tales vi.

Sig.—One to be taken thrice daily.

The use of lime water may be kept in mind as an addition to milk when the latter is given, but we are not inclined to attach such importance to its astringent value as some writers do, though it appears to exert a slightly sedative effect upon the stomach in some cases. Of special antiseptics such as salol, resorcin, and β-naphthol we cannot speak with any great hopefulness, as we have known them to fail on more than one occasion. Ichthoform, however, in one or two grain doses thrice daily is one of the best intestinal antiseptics we possess, and accordingly it may be resorted to should occasion warrant.

CHOLERA INFANTUM.

This is a very grave disorder, and one which is no doubt due to an impure milk-supply. It may follow

summer diarrhœa or even simple intestinal indigestion. It is a disease of far greater frequency in America than in this country.

Symptoms.—At first there is usually vomiting, first of the gastric contents, and finally of bilious material. Diarrhœa is either subsequent to or concomitant with the vomiting. The stools are at first somewhat like those of summer diarrhœa, but soon they assume their typical appearance and become like rice-water. The rectal temperature rises steadily, while the extremities become cold and clammy. The child at the outset is restless, but soon becomes listless and apathetic, with feeble pulse, depressed fontanelle, and characteristically cadaverous face.

Prognosis.—The majority of these cases succumb in spite of all treatment. Young infants especially fall easy victims to this disease, and in all cases the excessive loss of serum is badly borne, while the loss of weight is always extreme.

Treatment.—Prophylaxis is better than cure. When the disease occurs we must resort to intestinal irrigation, and this should be followed by an injection of normal saline solution to replace the loss of blood serum. As food we must give only small amounts of albumen water and brandy. The body must be kept warm by means of hot-water bottles or by hot bricks. The heart should be stimulated by minute doses of morphine and atropine. To be of any service these must be injected hypodermically. Holt advises $\frac{1}{100}$th grain of morphine and $\frac{1}{800}$th grain of atropine to be given every hour until improvement is observed.

ENTERO-COLITIS.

This may be met with either as an acute or as a chronic affection. It is variously spoken of as Ileo-colitis and as Dysentery. This disease differs from the other intestinal conditions already referred to in its being associated with inflammatory, or even with ulcerative lesions in the intestinal canal. We shall consider the Acute and Chronic forms in turn.

I. Acute Entero-Colitis.

As already mentioned inflammatory changes are met with in this condition, and in some instances we find the formation of a distinct membrane; in other cases the affected parts are covered over with deep, burrowing ulcers. As a rule the ileum and colon are the seats of these pathological processes, hence the term ileo-colitis which is sometimes given to this condition.

Etiology.—In many cases entero-colitis is but an advanced stage of summer diarrhœa; in others it is produced by long-continued intestinal indigestion. It often complicates pneumonia, while the membranous form may be met with in diphtheria, and we have seen a case occurring in a child of four years who was suffering from influenza. It is also found associated with measles and scarlatina.

Symptoms.—These resemble very closely the symptoms of intussusception. The bowels move very frequently, and the stools consist of blood and mucus which has always a characteristic gelatinous appearance. Very often a little fæcal matter is present. There is always considerable abdominal pain and discomfort, and usually vomiting. The temperature is rarely high, the range being from 100°

to 103° Fahr. Tenesmus is always a troublesome symptom, and thirst is usually intense. These symptoms, as a rule, continue for a few days, and then the mucus gradually disappears from the stools, the latter becoming more and more fæcal in character. If ulceration takes place the symptoms progress steadily. The stools smell badly, and the patient becomes greatly emaciated. In the membranous variety the symptoms are more severe, and recovery is much less certain.

Diagnosis from Intussusception.—There should not be any great difficulty in regard to this, as in intussusception there is no rise of temperature at first, and a tumour can usually be made out; while, after a time, constipation and not diarrhœa is a prominent feature in the case. Moreover in intussusception the child rapidly becomes collapsed, with feeble pulse and drawn face, which are not observable in acute entero-colitis unless the case has lasted for a considerable time.

Prognosis.—According to Holt the following symptoms in any given case would lead us to give an unfavourable prognosis:—continued high temperature, frequent vomiting, rapid wasting, an excessive amount of blood in the stools, severe nervous symptoms, and very weak pulse. We are led to give these on the authority of Holt as he has had a specially large experience of this disease. The prognosis also becomes grave when pneumonia supervenes, as it usually does in bad cases. Much also depends on the former history of the patient, and on his present surroundings.

Treatment.—Diet is of great importance. Milk always disagrees, and should never be given. Barley water, beef jelly, and whey may be chosen. Usually a small amount of brandy is advisable, especially when the pulse

is feeble. Thirst is often a very troublesome symptom as is also the vomiting. The former may be relieved to some extent by sips of iced water, while the vomiting generally ceases as soon as the diet is properly regulated. In every case it is well to begin by washing out the bowel with a solution of ichthyol in water (℥ss. to ℥i.). This has a remarkable anti-inflammatory action, and often affords great relief. We may combine this irrigation with a full dose of hydrarg. subchlor. by the mouth, though probably castor oil is more suited to this condition, and if the patient's stomach will tolerate it this should be given in preference to all other purgatives in this disease. Later, powders containing minute doses of pulv. ipec. co. (gr. $\frac{1}{8}$ to $\frac{1}{2}$) and bismuth. carb. (grs. ii. to v.) will be found useful in relieving the pain and tenesmus. When the child is recovering great care must be exercised in regard to feeding, as a little indiscretion will bring about a relapse. As soon as possible the patient should be sent to the country, where fresh air will greatly further his chances of complete and rapid recovery. Tonics should not be given for some time, as it is not desirable that the child should eat too much food until such time as the intestinal tract has become perfectly healthy. Then we may prescribe a mixture containing tinct. calumbæ and tinct. nuc. vom. as follows:—

℞ Tr. Calumbæ . . . . . ♏xxiv.
Tr. Nuc. Vom. . . . . ♏xviii.
Syr. Aurantii . . . . . ℥ii.
Aq. Dest. ad . . . . . ℥iss.

Misce. Fiat Mist.

Sig.—Thirty drops in water before each meal.

II. Chronic Entero-Colitis.

This is always a sequel to the acute form of the disease already described.

Symptoms.—The stools are not very frequent, but they always contain more or less mucus. Vomiting is seldom met with. There is progressive loss of weight and consequent emaciation with marked anæmia. The patient is always fretful and restless, while the temperature is usually normal or, in many cases, subnormal. Such patients often become the victims of general tuberculosis, and in any case pneumonia is very apt to supervene.

Diagnosis from Tuberculous Enteritis and General Tuberculosis.—The diagnosis is often exceedingly difficult, and can usually only be arrived at after carefully weighing all the facts of the case. No definite guide can be given. The temperature is only available in differential diagnosis when there is no lung condition present. In uncomplicated chronic entero-colitis the temperature will be normal, whereas in tuberculosis it will possess a swinging character. The presence of abundant mucus in the stools is a far more reliable guide, and accordingly this point should receive special attention.

Prognosis.—This is influenced by the previous history of the patient, by his surroundings, and by the presence or absence of complications, as well as by the nature and extent of the pathological changes in the intestine.

Treatment.—Irrigation of the bowel with ichthyol solution is one of the best means of treating this condition which is at our disposal. Every two or three days a small dose of magnes. carb. should be given, or, if preferred, castor oil may be substituted. Malted foods, skimmed milk, whey, beef or chicken jelly, raw meat juice, and even

eggs may be given. Later, fish may be added to the dietary if the child is old enough. Brandy is always a useful stimulant in these cases, and should it be disliked or disagree vin. ferri. may be substituted. Otherwise fresh air and good hygiene will do more than all other remedial measures to bring about the cure of what is apt to prove a very protracted disease.

TUBERCULOUS ENTERITIS.

This is rarely a primary disease, but is more commonly met with in the course of general tuberculosis, or as a complication of tabes mesenterica and tuberculous peritonitis.

Symptoms.—As a rule diarrhœa is the most noteworthy symptom present in these cases. The stools are frequent and generally contain blood and mucus. The hæmorrhage is due to ulceration which occurs in the solitary glands and in Peyer's patches. There are usually considerable pain and colic referred to the abdomen. In many cases the motions are more watery, contain small amounts of fæcal matter, and have a very unpleasant odour. As tuberculous enteritis rarely occurs alone we generally find evidences of peritonitis or adenitis present as well. Tubercle bacilli may, in some instances, be isolated from the stools.

Treatment.—As these patients are usually having cod-liver oil, it is advisable to stop this as it frequently aggravates the diarrhœa. Guaiacol carbonate in one- or two-grain doses thrice daily is useful, but personally we have had the most marked successes with ichthoform.[1] For

[1] For full details see author's paper on "The Therapeutics of The Ichthyol Compounds" in the *Lancet*, March 12, 1904 (pp. 717 *et seq.*)

children generally the dose ranges from 2 up to 10 grains given thrice daily, but it is preferable to give small doses frequently. It may be given concealed in milk, cocoa, or gruel, but we prefer to disguise its appearance by giving it sandwiched between two very thin pieces of buttered bread. Where administration by the mouth is impossible the drug may be given as an ingredient in an enema of mucilage of starch. In some of our cases the results of its employment were very striking, and this remedy certainly bids fair to become a specific for intestinal affections, seeing it is not only an astringent and antiseptic, but an anti-inflammatory agent as well.

The feeding of these patients requires great care, and, as in all tuberculous cases, fresh air is a *sine qua non* to the ultimate recovery of the child.

DIARRHŒA AS A SYMPTOM.

A short note on this subject will not be out of place. As we have already seen, there are many diseases in which diarrhœa forms the prominent symptom. We shall briefly recapitulate these, and in addition shall mention other diseased or disordered conditions in which diarrhœa may be present:—

1. *Gastric Indigestion* and *Gastritis*, usually the result of improper feeding or over-feeding.

2. *Intestinal Indigestion* which may be a sequel to or occur independently altogether of gastric trouble.

3. *Summer Diarrhœa.*

4. *Cholera Infantum.*

5. *Entero-Colitis.*

6. *Tuberculous Enteritis* and *Abdominal Tuberculosis* in general.

7. *Dentition*, which should always be regarded as a cause with a great deal of reserve, bad feeding usually forming the real cause in such cases.

8. *Nervous Influences*, such as fright and anger.

9. *Exposure to Cold and Wet*, which is a fairly common cause in young children.

10. *Kidney Disease* and *Uræmia*.

11. *Poisons*, either taken in the form of food, or drugs, or swallowed in ignorance.

12. *Rachitis*.

In every case treatment is not to be carried out by any routine method such as the use of opium and chalk mixture. The scientific physician will first find out the precise cause of the diarrhœa, and will in almost every case attend to the diet, order a warm abdominal bandage, and see that the intestinal tract is first emptied of its irritating contents before administering astringents.

HÆMORRHAGE FROM THE BOWELS.

An enumeration of the causes, with a note as to the general treatment of such cases, must suffice.

Etiology.—Blood may be passed by the bowel during the first few hours or days of life, and this condition is known as melæna neonatorum. (*vide* p. 17). Apart from this the hæmorrhage may result from blood which has been swallowed, as in epistaxis. Gastric or duodenal ulcer may also cause it. Rectal polypus is a very common cause of bleeding from the bowel in young children, as is also intussusception. A few drops of blood may appear after severe straining when the infant or child is constipated, and we have seen several cases of this kind which caused much anxiety to the friends, and in one of which the

medical attendant mistook a hardened mass of fæcal matter for a polypus.

Treatment.—Care must be taken in forming a correct diagnosis, which is not always a simple matter. If the condition causing the hæmorrhage be a surgical one no time should be lost in operating, as young children bear the loss of blood badly. Solution of adrenalin is valuable in some cases, and should be given a trial. Care must be taken not to mistake fæces in the rectum for a polypus, nor to regard blood passed by the bowel as always indicative of some serious organic lesion.

CONSTIPATION.

Constipation is more frequently met with in infancy and childhood than some authorities seem to imagine. This condition, of course, ought not to be met with at all in healthy children, but, unfortunately, we have often seen children otherwise strong and well nourished who have become the subjects of chronic constipation in consequence of their improper management by parent or nurse.

Etiology.—One of the commonest causes of constipation in infancy, we believe, is that most pernicious habit of giving the baby castor oil a few hours after its entrance into the world. Another cause, we fear, is the all too prevalent custom of giving infants "soothing" medicines which usually contain some preparation of opium. Again, a constipated nursing mother always has a constipated nursling. Apart from these causes unsuitable diet accounts for most of the cases of constipation met with in practice. Thus the use of condensed milk, which is very deficient in fat, will soon give rise to this condition, and so also will a food-supply too rich in proteids. Again

too much farinaceous food always leads sooner or later to the manifestation of constipation. The use of castor oil and other active drugs often induces constipation by weakening or even paralysing the intestinal muscles. Rachitic children are often found to be constipated owing to their general lack of tone. Anal fissure and rectal polypus may cause constipation reflexly.

Symptoms.—In many cases there are no special symptoms, while in others we find nocturnal restlessness, the symptoms of dyspepsia, and generally a distaste for food. A local examination of the rectum should be made in most cases, as only in this way can such conditions as anal fissure be detected.

Treatment.—The treatment of constipation in infancy and childhood is a matter demanding much care and thought on the part of the physician. *Drugs must never be used until all other resources have proved unavailing.*

Regular habits must be formed from a very early period. The nurse must see to it that her charge's bowels are moved at least once every day, and that the motion in every case is not unduly small, hardy, or lumpy. It is neglect of this duty on the part of the nurse that engenders the constipation habit even in quite young children.

Then, again, the food requires to be seen to. If the child is at the breast and the mother herself is constipated, the latter, not the former, must be treated. If the milk is too rich in proteid this must be put right, and if deficient in fat, the fat percentage must be increased. When bottle-fed babies are constipated the cause often lies in the use of a cream which is very deficient in fat, and the use of a richer cream, or an increase in the quantity, will often put matters right. After the sixth month a tea-spoonful of orange juice, given just before

meals, often corrects the constipation. A tea-spoonful or two of water given occasionally often serves the same useful purpose. In the case of older children a liberal supply of fresh fruit and vegetables, with barley bread, will often cure the condition.

Where diet alone fails to give relief cold sponging of the abdomen, followed by massage of the colon, should always be given a fair trial. When diet and massage fail then drug treatment may be considered.

For temporary use nothing is better than glycerine suppositories. Fluid magnesia may be added to the milk, or sod. phosphas may be taken with the food. Recently we have tried small doses of phenolphthalein with considerable success. Confect. sulphuris is readily taken by children, as are also some of the more palatable preparations of cascara recently introduced, such as the combination of malt with this remedy. In those cases which are associated with marked reflex disturbances we usually prefer to order a full dose of hydrarg. subchlor. at first, and continue the treatment by means of some of the agents enumerated above.

If the constipation be the result of some local condition means must be taken to remove this, as no amount of dietetic or drug treatment can be of any possible value so long as some definite local disease exists.

COLIC.

By the term colic we mean that variety of spasmodic pain which has its origin in the intestinal canal.

Etiology.—In young infants colic is a very common symptom, and one which may give rise to intense suffering. In this case it usually results from milk which is too rich

in proteids being fed to the child. It is then usually associated with the presence in the stools of undigested curds. In fact colic, curds in the stools, and constipation, form a regular tripod of symptoms in such cases. Constipation alone may give rise to colic, and so may intestinal dyspepsia. The presence of any irritant in the bowel will likewise produce it, such as fermenting food-material and worms. Then, again, it may be brought on by chilling of the skin surface, a factor very often overlooked in the treatment of this condition. It is also frequently met with, just as constipation is, in rachitic subjects, and here it is doubtless due to loss of muscular tone in the intestines. It may also be due to intussusception, appendicitis, and certain poisons such as arsenic.

Symptoms.—In infants a very typical picture is presented to us. The child cries loudly, and is seen to draw up his legs, while his face is contorted. If the case is mild the child may only be somewhat irritable and restless. In infants colic is always found associated with marked flatulency, and is often relieved by the passage of flatus.

Treatment.—In ordinary cases by simply turning the child over on his face great relief may be afforded. Failing this a hot flannel should be rubbed over the abdomen. Further, a large poultice of linseed meal may be applied, and if necessary a glycerine suppository inserted into the bowel. In the case of older children some carminative may be found useful, and the following prescription is often distinctly beneficial:—

℞ Spt. Ammon. Arom. . . . . ℥i.
Tr. Camph. Co. . . . . ℥ii.
Tr. Zingiberis . . . . . ℥ii.
Aq. Menth. Pip. ad . . . . ℥iss.

Misce. Fiat Mistura.

Sig.—℥ii. omni hora ex aq.

In every case care should be taken that the body is kept warm, particular attention being paid to the feet which will often be found icy cold in such cases.

DILATATION OF THE COLON.

This is a condition the occurrence of which has been recorded a few times, and is one which probably would be found to be by no means uncommon, in slight degree at least, if it were readily recognised.

Etiology.—In some instances the dilatation is no doubt congenital, and therefore present from birth. These cases are associated with hypertrophy which may be considerable. In other cases dilatation of the colon is caused by chronic constipation and the use of enemata and other ill-advised measures for its relief. In the latter group of cases the dilatation produced tends to aggravate the constipation, and so we are face to face with a condition of cause and effect which is exceedingly difficult to treat.

Symptoms.—In the congenital cases, which are certainly the least common, the patient presents a distended abdomen, and the coils of the large intestine, and more especially of the transverse colon, may stand out in a characteristic manner during peristalsis. There is in addition a history of obstinate constipation always obtainable. In the non-congenital cases the evidences of the condition are much less marked, though a prominent abdomen and a history of chronic constipation are always present. It has been pointed out that this condition may be mistaken for tuberculous peritonitis, and so this possible error in diagnosis is worth bearing in mind.

Treatment.—The treatment in the milder cases is that of constipation (*q.v.*), while in the congenital variety

avoidance of this symptom is of the greatest importance. Such children require to be fed carefully and to have their bowels moved at least once every day. Massage as a means to this end should always be kept in mind, while the question of operative measures may have to be considered, though generally speaking surgical treatment is usually inadvisable.

WORMS.

The *Thread-Worm* (*Oxyuris Vermicularis*) is by far the most frequently met with. These are small worms, and resemble pieces of white thread to the naked eye. Their habitat is the cæcum, but they are usually found located in the rectum and at the anal orifice. They may enter the vagina, especially during the night, and give rise to an exceedingly troublesome form of vulvo-vaginitis. They always cause marked irritation at the anus, and not uncommonly a certain amount of tenesmus is present as well. These worms are often the cause of disturbed sleep and loss of appetite.

The *Round Worm* (*Ascaris Lumbricoides*) is the next most common variety of worm seen in children. It resembles very closely the common earthworm, and measures roughly from 6 to 12 inches. The small intestine is their favourite nidus, but they are often found in the stomach. They may, however, migrate into the nose or the pharynx, and even into the larynx. Cases are on record where they have been met with in the common bile duct and in the appendix vermiformis. They give rise to all kinds of nervous symptoms, but can really only be diagnosed when vomited or passed per rectum, or when their ova are found in the fæces.

Tape-Worms (*Tænia Solium and Tænia Mediocanellata*)

are not uncommonly met with in children. For their description the reader is referred to the ordinary medical text-books. It has been stated on good authority that tape-worm is rare in children, and that nervous symptoms are much less common than when round worms are present. This has not been our experience. Indeed we have recently[1] called attention to the relationship of *tænia solium* to chorea, and have recorded two cases where the symptoms entirely disappeared when the worm was expelled. There can be little doubt, therefore, that tape-worm may be associated with nervous symptoms.

Of the other varieties of worms we need not speak, as they are much less frequently met with than those we have mentioned. It must be borne in mind that such symptoms as picking of the nose, grinding of the teeth, and dark rings under the eyes are not necessarily symptomatic of the presence of worms. The only reliable guide to diagnosis is the finding of the worms or their ova in the stools.

Treatment.—For thread-worms it is usually advised that the bowel be washed out with a solution of salt and water (℥i. to ℥vi.), but we have found it much less troublesome and more effective to give the following powder early in the morning:—

℞ Santonini . . . . . grs. ii.
Hydrarg. Subchlor. . . . . grs. ii.
Sacchar. Lactis . . . . . grs. vi.

Fiat Pulv.

Sig.—To be taken while fasting.

The round worm is also best treated by means of the above powder. Tape-worm is best got rid of by administering the extr. filicis liq. (♏ xxx. to ♏ lx.) in milk, after first

[1] Vide *Brit. Jour. of Children's Diseases*, April 1904.

emptying the intestinal canal by means of mild aperients. Where this fails ol. terebinthinæ may be tried as recommended by Eustace Smith. In all cases, after the worms have been got rid of, the gastro-intestinal tract must be brought into a healthy condition, and this is best achieved by strict attention to diet and the administration of alkaline tonics.

INTUSSUSCEPTION.

This is perhaps the most common form of intestinal obstruction met with in infancy and childhood. It consists essentially of the passage of one part of the bowel into another, which encloses it as a glove does the fingers. With the anatomy of intussusception we will not trouble the reader, as this is sufficiently impressed upon him in all pathological text-books. We may mention, however, that an intussusception consists of three intestinal layers, and that as a rule the condition is met with at the ileo-cæcal valve, the ileum with the cæcum passing downwards into the colon. This is known as an ileo-cæcal intussusception. Then we have the variety termed the ileo-colic, in which the ileum passed into the large intestine, while the ileo-cæcal valve itself does not move. Other varieties consist in the passage of one portion of small intestine into another, or of one part of the colon into an adjoining portion.

Etiology.—There is little doubt that this condition is commonest in children who are out of health, and who suffer from some intestinal affection such as diarrhœa. Possibly anatomical peculiarities of the intestine and its mesentery in children render this phenomenon more liable to occur at this period of life. It is usually stated to be

more commonly met with in the male than in the opposite sex. We have observed its occurrence in one or two instances where the child had been dosed with purgatives with the view of correcting chronic constipation.

Symptoms.—The clinical picture is usually well-pronounced and unmistakable. There is always pain of a paroxysmal nature in the abdomen, and this is always severe, causing the child to cry out. In addition we have vomiting and tenesmus with the passage of mucus and blood by the bowel. An elongated sausage-shaped tumour can usually be felt in one or other iliac region, while in many cases a rectal examination will reveal its presence. In all cases, where any doubt exists, we would insist on a careful rectal examination being made, as thereby the condition may often be diagnosed when otherwise it might be missed. If the patient is unrelieved by treatment, inflammation of the intestine will follow, great pain will be experienced on pressure over the tumour, while the temperature will be raised.

Prognosis.—Early treatment renders these cases most hopeful. If neglected, inflammatory mischief becomes superadded, while gangrene of the invaginated bowel with subsequent peritonitis is to be feared. The prognosis, therefore, chiefly depends on the promptitude with which the case is treated.

Treatment.—The first objects to be aimed at are the relief of the patient's sufferings, and above all things arrest of the peristaltic action of the intestines. These may be accomplished by giving sedatives by the mouth, but we consider as far more efficacious their administration by means of suppositories. For an infant of six months a suppository containing $\frac{1}{30}$th gr. of the extract of opium and $\frac{1}{100}$th gr. of the green extract of belladonna will be found

useful, and this may be repeated in two or three hours if required. It is well to remember that infants suffering from conditions such as this tolerate opium more readily than they would do under less serious circumstances.

The next thing to be done is to endeavour to disengage the invaginated bowel. This may be accomplished by various means, but we prefer the injection of warm water per rectum under chloroform. The patient should be put as nearly as possible into the knee-elbow position. No great head of water must be employed, and the tube should be introduced well inside the rectum. From two to six pints may be injected at a time. Some authorities prefer olive oil to water, and if one injection of water does not suffice this may be substituted. In any case the physician's efforts will be materially aided by careful manipulation of the intestines during the process of injection. After reduction has been completed a firm binder must be applied to the abdomen in the shape of a broad domette bandage, put on in figure-of-eight fashion. It is also advisable to give either an opium suppository, or a rectal injection of chloral in warm milk.

Failing reduction by this means operative measures must be early resorted to, but these should not be advised in the first instance as intussusception is very often quite amenable to the treatment we have described.

IMPERFORATE ANUS.

Cases are met with where the anus is represented by a minute slit, but the condition under consideration is one in which the anal orifice is entirely absent. This may be associated with absence of the rectum or with other abnormalities. The treatment of these cases is entirely

surgical. It is well, however, to remind the reader that where no meconium is passed for a day or two after birth a local examination must be made in every case.

PROLAPSUS ANI.

This is a condition which varies in degree, and may be met with in all grades of severity.

Etiology.—Prolapse is favoured by ill-health from any cause as the muscular structures lose their tone under such conditions. Constipation and violent purgation are apt to induce it, as is also any inflammatory condition of the intestinal canal. A tight prepuce is not an uncommon cause in delicate children, while very acid urine, or the presence of a vesical calculus, may produce it.

Diagnosis.—The condition is readily diagnosed as the appearance of the prolapsed mucous membrane could hardly be mistaken by a careful observer.

Treatment.—The prolapsed bowel is usually returned quite readily by slightly inverting the child and using gentle pressure with the two thumbs which have been previously oiled. If the prolapse has existed for some time before being seen by the medical attendant there may be a good deal of congestion present. This may readily be got rid of by the application of cold cloths, with the addition, if thought necessary, of a little adrenalin solution. When the prolapsed bowel has been returned it should be kept in position by means of a firm cotton wool pad fixed by means of a bandage. Care must be taken to prevent recurrence, and to secure this frequent injections of cold water are to be recommended. As a rule this condition ceases to recur after the earlier years of childhood have been passed.

RECTAL POLYPUS.

This is a purely surgical affection, but it is one with which every student of children's diseases must be familiar. These growths may be as small as a pea or as large as a cherry. They are really adenomata, and are always extremely vascular.

Symptoms.—The presence of a polypus in the rectum causes bleeding from the bowel. This usually comes on during defæcation, and is apt to continue for some time after. It is one of the most frequent causes of rectal hæmorrhage in children, and may produce such a severe loss of blood as even to endanger life.

Complications.—The two commonest are prolapsus ani and intussusception. Otherwise polypi may give rise to mucus in the stools and severe tenesmus.

Treatment.—The polypus may be removed by ligaturing its pedicle and then excising the tumour. If the latter is very small it may be twisted off with a pair of forceps.

APPENDICITIS.

In speaking of appendicitis Deaver rightly remarks, "The term should embrace those various inflammatory conditions found in the right iliac fossa which were described by writers prior to 1880 as typhlitis, peri-typhlitis, paratyphlitis, cæcitis, and so on." The term is certainly not to be limited to inflammatory conditions of the appendix vermiformis alone. We need not weary the reader by giving an exhaustive account of the various morbid changes met with in the appendix in this disease. For a detailed description of these we would refer him to any modern text-book of morbid anatomy. Here we

shall merely consider the disease in its clinical and practical aspects.

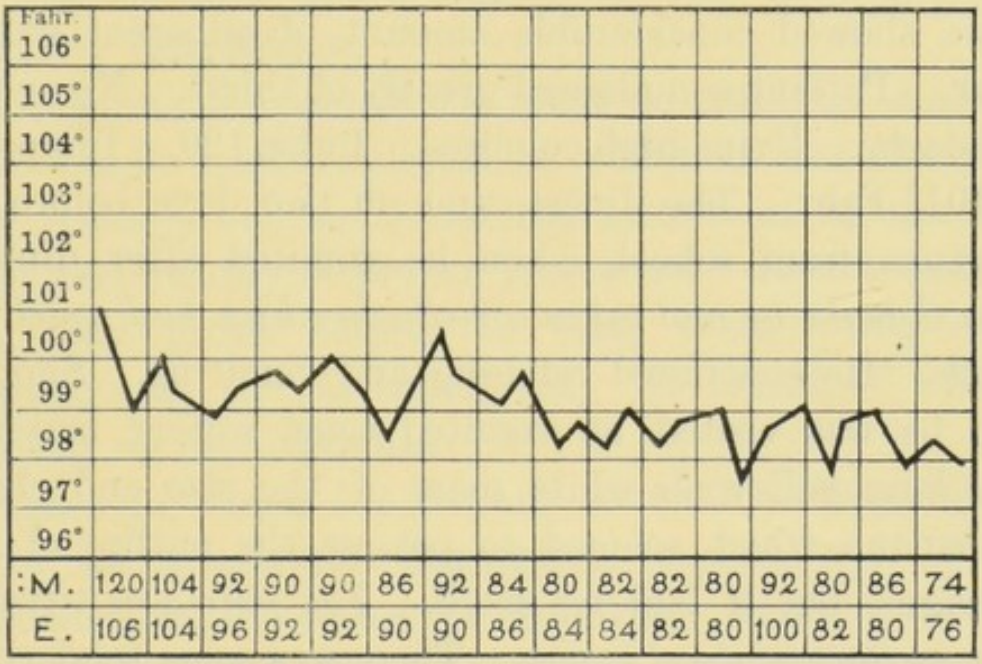
Etiology.—We have no hesitation whatever in saying that tuberculosis and rheumatism are frequently found as predisposing causes of appendicitis in children. We have seen several cases where a family history of one or other of these conditions was obtained, and it would be well if physicians and surgeons would carefully investigate this matter, as it is one of great importance. Apart from these constipation is the great factor in its production. When any of these conditions is at work exposure to cold and wet may induce an attack.

Symptoms.—There is every reason to believe that many cases of appendicitis remain undiagnosed owing to the fact that in very young children the symptoms are by no means typical. Only a careful examination of the abdomen and rectal exploration may reveal the presence of the disease. All that may be observed is a slight rise of temperature, with some vomiting and furring of the tongue. This symptom group is very readily put down to some slight gastric disturbance, and it is only when the condition of the patient becomes more serious that a careful physical examination may clear up the diagnosis.

Generally speaking, the pain at the outset is found to be most marked in the umbilical region, but it may be located almost anywhere in the abdomen. The point to be borne in mind is that a painful spot in the right iliac fossa is but rarely got in children at the start. Even after a time the pain is not always situated in the region of M'Burney's point, but may be most marked in the left iliac fossa.

Tenderness on pressure is rarely well marked at first, but soon becomes a prominent feature of the case. In

addition to pain and tenderness the abdominal muscles are more or less rigid on the affected side, and the patient usually occupies the dorsal position with the leg on the affected side flexed at the knee in order to relax the abdominal muscles. Vomiting may be entirely absent, but is often well marked, though, in favourable cases, it rarely continues beyond the first forty-eight hours. Diarrhœa or constipation may be present. The tempera-



M.	120	104	92	90	90	86	92	84	80	82	82	80	92	80	86	74
E.	106	104	96	92	92	90	90	86	84	84	82	80	100	82	80	76

FIG. 6.—Temperature Chart in a case of Appendicitis of moderate degree. Figures represent the morning and evening pulse-rate.

ture in children is rarely high, and we should say 102° Fahr. may be looked on as a very high temperature in an average case. More frequently the thermometer does not rise above 100° Fahr. The pulse is of more importance than the temperature, though text-books do not seem to lay stress on this fact. As a rule a moderately rapid pulse gives the best prognosis, whereas a slow one or a very much accelerated one renders the ultimate chance of recovery most uncertain.

The record of a case which was under our care some time ago will illustrate well the points we have been trying to emphasise:—Charles R., æt. 13½. Schoolboy. Rheumatic family history. Previous health good, but had a distinct tendency to constipation. Illness began two days before. When seen the patient complained of "vomiting and pain in the stomach." His eyes were sunken, with dark areolæ round them. Face somewhat flushed. There was some pallor of the conjunctivæ. Tongue showed considerable amount of adherent white, dry fur. Patient complained greatly of thirst. No cough or headache. Urine high coloured. Pulse 120. Temperature 101° Fahr. The illness came on two days before on his return from school, when he vomited after dinner. *It was thought he had taken something which had upset his stomach.* He continued retching and vomiting. Shortly before he was visited he vomited some watery material and a long yellowish white mass of the size and shape of a banana, which seemed to possess the outline of the œsophagus, but it had no smell. *The pain was situated chiefly in the umbilical region.* There was some tenderness on pressure over M'Burney's point. The vomiting continued until the fourth day of the disease, when it entirely ceased. Under treatment the pain gradually disappeared and the temperature became continuously normal at the end of a fortnight. He continued to be very pale and thin for many weeks, but good feeding and abundance of fresh air restored him once more to health and strength.

Complications.

(1) Perforation may occur. (2) Abscess formation may result. (3) General peritonitis may supervene. These are the three principal risks which any patient suffering from appendicitis runs.

Recurrence of the symptoms is not uncommon, and indeed one attack always renders the patient more liable to others on very slight provocation, though recurrence is less commonly seen in the case of children.

Prognosis.—This is not necessarily a fatal disease, and many cases recover completely without operation. If abscess formation, perforation, and general peritonitis do not supervene then the prognosis is extremely good; otherwise it becomes grave owing to the risks attending operative interference.

Diagnosis.—Appendicitis must be carefully diagnosed from simple acute indigestion. This is not always an easy matter, but as a rule the symptoms in the latter yield very readily to proper treatment. Rectal examination may prove helpful in some cases, while careful palpation of the abdomen may be found of value in clearing up the diagnosis.

Cases in which the patient complains every now and again of abdominal discomfort, especially if this be associated with nausea or vomiting, should always be regarded as suspicious. Very often such children eventually develop a typical attack of appendicitis.

From intussusception it is usually distinguished very readily, as in this condition we have blood and mucus in the stools without any rise of temperature. Here again a careful rectal examination should never be neglected.

Treatment.—We have elsewhere[1] given an account of our views regarding the medical treatment of appendicitis. We believe that many cases of this disease, even in its severer manifestations, may be completely cured without the intervention of the surgeon, and certainly medical treatment ought always to be given a fair trial. In the

[1] Vide *The Lancet*, Oct. 4, 1902, pp. 926 *et seq.*

paper referred to we have remarked that the treatment of appendicitis resolves itself into the employment of a *method* of dealing with the case. Here the exercise of our judgment and the careful consideration of every fresh development as it arises are constantly required. "We must ever be on the lookout lest complications supervene, now watching the patient's pulse and temperature, now marking the degree of physical strength, now estimating the amount of pain and carefully examining the locus morbi."

Pain is the first symptom which demands our attention. No matter what the site or the character of the pain, it is best relieved by means of local applications. Hot fomentations, especially with the addition of turpentine, seem to be the most efficacious means at our disposal for combating the pain of appendicitis. To be of any use, however, they must be kept constantly applied, that is to say, as soon as one turns cold another must be put on; and these should be continued persistently until the pain is materially relieved. Afterwards an occasional fomentation is all that is usually required. The application of ice has also been recommended, but, in the case of children at all events, it has many disadvantages, and we much prefer hot fomentations. Heat also is more soothing than cold in such cases, and so warm applications have everything to recommend them. Poultices must never be applied as they are too heavy, and besides they are very likely to favour abscess formation. As to the giving of opium opinion differs greatly. For our own part we would hesitate to give it, as it certainly masks the symptoms and is apt to derange the patient's digestion, while it may interfere with the character of the pulse.

Sickness and vomiting are usually very troublesome. As a rule, however, these subside early, except in the graver cases in which peritonitis supervenes. Ice or iced potash water may be tried. On the whole, however, much may be done by careful feeding to alleviate these distressing symptoms. Frequency of micturition is sometimes troublesome, and this is best controlled by small doses of the tincture of hyoscyamus. Headache is best treated by iced cloths applied to the forehead, or by an ice-bag, care being taken to renew the ice from time to time.

The feeding of the patient is a matter of very great importance. Beef or chicken jelly with milk and potash water, or milk and barley water, should be given in minute quantities at frequent intervals. A small amount of whisky and water is often of value, for this is a food as well as a stimulant. Apart from the articles mentioned the less food we give the better. If too much is given the result will be sickness and vomiting whereby much unrest and discomfort are occasioned. In feeding the patient we must carefully guard against the production of flatulence. "The giving of too much milk" (to quote again from the article already referred to), "or of milk undiluted, is very liable to occasion distress, if not actual pain, from flatulent distension of the stomach and intestines. Practitioners are apt to forget this in their anxiety to nourish the patient." Indeed, great care must be exercised for a long time in the feeding of the patient during convalescence; the condition of the tongue and to some extent the desire of the patient will serve as guides as to the rate at which we may advance up the dietary staircase.

When the abdominal distress has been considerably relieved much good may be done by applying a large pad of cotton wool over the affected part and holding it in

position by a broad domette bandage encircling the abdomen, while the patient should be kept on his back in order to rest the inflamed parts as much as possible.

Constipation is best relieved by means of glycerine suppositories, while after a time small doses of extr. cascaræ liq. and tinct. belladonnæ will suffice to keep the bowels active. When convalescence is being established a change to the country is usually to be recommended in order that the patient may regain a proper measure of strength. Feeding and clothing must be strictly attended to, and he must not be allowed to romp about too much at first.

When should a surgeon be called in? This is a question usually asked, and it is by no means an easy one to answer dogmatically. If medical treatment is to succeed it must be undertaken with more than ordinary watchfulness and care. Only in such circumstances will it prove of value. To put it broadly, we should say that surgical interference may be considered when the pulse becomes very rapid, when the pain does not subside within three or four days, or when the temperature and pulse suddenly fall. If a distinct abscess can be detected it must be dealt with at once. Otherwise each case must be considered on its own merits. There is nowadays too much anxiety on the part of some surgeons to operate in these cases; but, on the other hand, many lives are lost from delaying to call in the aid of a surgeon. Operations are most successful during the period of quiescence, but if the child recovers from the first attack it would be unwise to operate, as recurrence is much rarer in the case of children than in adults. As we have already indicated appendicitis is a disease which taxes the powers of the physician to the utmost, as these cases are always anxious ones at the best,

and the patient can never be considered safe until all pain is gone, the temperature normal, and the pulse once more slow and steady.

DISEASES OF THE PERITONEUM.

Peritonitis may be either General or Local. It may be either Acute, Subacute, or Chronic in its nature, the tuberculous variety being very frequently of the latter type.

Acute Peritonitis.

This is a fairly common disease in children, but is much less frequently met with during infancy and the years immediately following it.

Etiology.—The causes of acute peritonitis are very varied. Apart from injury we may group the causes of this disease under the following heads :—

1. *Abdominal Conditions.*—Such as diarrhœa, obstinate constipation, acute intestinal obstruction (more especially intussusception), appendicitis, gastric ulcer, intra-abdominal abscess howsoever arising, and nephritis.

2. *Non-Abdominal Conditions.*—It may be the result of pleuritis; and cases have been placed on record in which peritonitis has followed pneumonia.

3. *The Infectious Fevers.*—Scarlatina is perhaps one of the most frequent of all these fevers to be associated with peritonitis. It also sometimes occurs in cases of dysentery, typhoid, smallpox, and erysipelas.

Symptoms.—Acute peritonitis is always a very grave disease, and is ushered in by very definite symptoms. There is intense pain in the abdomen, and the pulse is rapid and wiry. The temperature ranges from 104° to 106° Fahr. The bowels are usually constipated, but

diarrhœa is often a very pronounced feature of the case. Vomiting is almost always present, and may form a very distressing symptom. The patient lies on his back with legs drawn up and bent at the knees. On percussing the abdomen a tympanitic note is obtained, and there is very little movement on respiration. In infants these symptoms are often entirely absent, and the patient is merely cross and irritable, refusing all food and showing marked indications of some serious internal mischief.

Prognosis.—The younger the child the less hopeful is the prognosis, but even in the later years of childhood peritonitis is a very serious disease, many dying of it within a few days of its onset. The cause of the condition will modify the prognosis in any particular case; while the localised form of the disease always gives less anxiety than the generalised variety.

Treatment.—The treatment of acute peritonitis is summed up in the monosyllable *rest*. The patient must be made to lie absolutely still on the back, and he must on no account be allowed to rise from that position. The gastro-intestinal tract must be rested by giving as little food as possible by the mouth, and only such as is most readily digested. Milk to which a small amount of one of the malted foods has been added, whey, beef jelly, and barley water, should form the principal articles of food during the course of the disease. Intestinal peristalsis must be prevented by means of small amounts of opium. The tincture of the B.P. may be administered in 5 to 10 minim doses at short intervals, or a suppository containing $\frac{1}{32}$ to $\frac{1}{8}$ of a grain of morphia may be placed in the rectum. Of local applications we prefer hot fomentations containing turpentine, but ice is spoken of very favourably by many authorities.

All attempts at evacuating the bowels should be avoided until the graver symptoms have passed off, and then an enema of glycerine or of olive oil will be found the most effective means of securing this object. Usually towards the termination of the disease the patient is exceedingly weak, and therefore alcoholic stimulation is to be recommended. Operative measures may be necessary in certain cases, more especially when pus is present.

Chronic Peritonitis.

Under this head we shall consider (1) Non-tuberculous cases, and (2) Tuberculous ones.

1. *Chronic Non-tuberculous Peritonitis.*

This is a comparatively rare affection. Usually ascites is present in these cases, the causes of which are somewhat indefinite. Chronic peritonitis with ascites may, however, be met with in children suffering from sarcoma of the kidney; while it may also prove to be the result of intestinal disease.

Symptoms.—These cases usually come before the physician when they are fully developed, and then the abdomen is found to be prominent and to present the usual signs of ascitic distension. Associated with the physical condition we may have considerable emaciation of the patient, with some diarrhœa and perhaps vomiting. There is rarely much pain or fever, and as a rule the fluid is gradually absorbed, the patient making a somewhat slow recovery.

Treatment.—This consists essentially in rest and careful feeding. In order to assist in the draining off of the ascitic fluid agurin in 2 to 5 grain doses twice daily is to be highly recommended, while in lieu of this potassii

acetas in doses of 5 to 10 grains may be given. Sodii iodidum is greatly praised by Jacobi, and should be kept in mind when diuretics prove ineffectual. Drainage by means of Southey's tubes is often of service. At the same time the general strength of the patient should be maintained by administering preparations of the glycerophosphates and malt extract.

2. *Chronic Tuberculous Peritonitis.*

Tuberculous peritonitis, although it may be either acute or chronic, is usually of the latter type; and so the general heading under which we have grouped it is, for all practical purposes, a convenient one. In these cases ascites may or may not be present, and even where there is fluid it is rarely great in amount. It may be primary, but is often secondary to tuberculous disease elsewhere.

Symptoms and Physical Signs.—The symptoms are often not at all well marked, and consist of progressive emaciation, loss of appetite and strength, restlessness and irritability, thirst, diarrhœa, and very often pain in the abdomen. Accompanying these somewhat indefinite symptoms we have a progressive enlargement of the abdomen. On inspection we notice how prominently it stands out from the otherwise emaciated body. On palpation a sensation as if the cavity were full of putty-like material is experienced. Percussion will be more or less dull, but especially above the umbilicus in the position of the omentum. If ascites is present it will give the usual characteristic signs. Sometimes enlarged tuberculous glands may be detected on careful palpation. We have already pointed out the importance of a rectal examination in many diseased conditions of infancy and childhood, and tuberculous peritonitis is one of these. By

rectal examination such cases may often be discriminated from simple chronic peritonitis with ascites, and from other conditions such as renal sarcoma. Examination of the eye by means of the ophthalmoscope may yield helpful results, but tubercles in the choroid are very seldom present.

The following notes of a case recently under our care will help to fix the leading symptoms and signs more permanently upon the reader's memory :—

W. F. male, æt. 12. Had been complaining more or less for nearly six months of pain in the abdomen, especially on going to stool. There was no history of tuberculosis in the family, and patient had been comparatively healthy until now. He had never had scarlatina, measles, or whooping-cough. About ten months ago he had an attack which resembled influenza, and since then he had suffered from slight cough. Four months ago he complained of a pain in the left side of the chest which was relieved by mustard poultices. After this he felt the pain in the abdomen becoming more constant and severe. It was a dull pain, and there seems to have been considerable flatulence associated with it. The abdomen had been gradually becoming more and more swollen. When first seen he was lying in bed on his back with knees flexed. The face was haggard and on each cheek was a distinct flush. The body generally was much emaciated. The tongue was moist with some furring along the centre. Appetite was poor, and thirst excessive. The bowels were quite regular. On palpation the abdomen had an indiarubber-like feel, but there was no pain or localised tenderness and no fluctuation was obtainable. The percussion note was dull all over. The temperature was 100·4° Fahr., and the pulse rate 80 per minute. At the left apex the breathing was much harsher than normal, with

an occasional rhonchus. Under treatment he improved greatly, but when last seen there was a distinct band of dulness which extended upwards from the right hypochondrium across to the opposite side, and enlarged glands could be felt on deep palpation. The temperature throughout was of a swinging type as illustrated by the accompanying chart.

Prognosis.—Everything depends on the care with which the child is treated. If he cannot obtain pure air

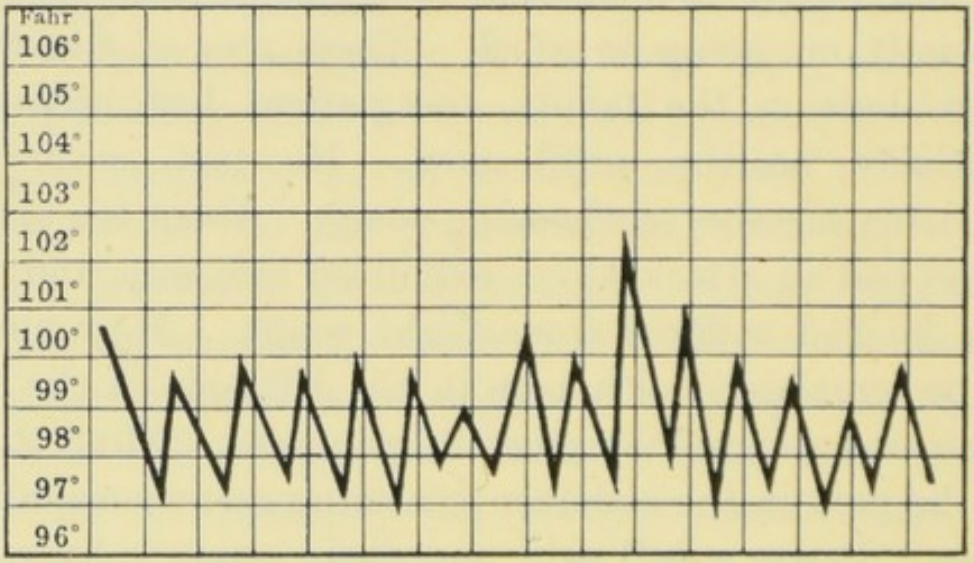


FIG. 7.—Temperature Chart in a case of Tuberculous Peritonitis.

and good food there is little hope of his ever recovering. Otherwise the prognosis is fairly good, though probably a complete restoration of the peritoneum to normal is exceptional.

Treatment.—First and foremost must be placed perfect hygienic surroundings. An hospital ward is, therefore, not an ideal spot for such cases. They will be best treated in a small private home, in the country by preference, where the patient may lie out in the open air when the weather permits, exposed to the invigorating influence of fresh air and sunlight. Next we have to feed the patient

in as careful a manner as possible. Nothing likely to cause gastro-intestinal catarrh should be given to the child.

Of internal remedies iodides seem useful in some cases, while mercurial ointments for inunction over the abdomen have always been favoured by the profession. The following prescription will be found a useful one:—

℞ Ung. Hydrargyri
Lanolini . . . . . āā ʒiv.

Fiat Ung.

Sig.—A small piece to be well rubbed into the affected parts at bedtime.

In our hands ichthyol-vasogen (10%) has proved of undoubted service. Of ung. iodoformi we cannot speak from personal experience, but it is well spoken of by some writers.

Where medical treatment proves ineffectual surgical interference may be considered in certain cases, more especially where fluid is present. Incision or laparotomy may be resorted to in such cases with decidedly beneficial results in many instances.

The after-treatment of the patient is of great importance. A prolonged holiday in the country or by the seaside, abundance of wholesome food, and the administration of tonics are always indicated.

TUBERCULOUS MESENTERIC ADENITIS.

(Tabes Mesenterica.)

This disease very seldom occurs alone, but is usually associated with tuberculous enteritis or peritonitis. The old term *tabes mesenterica* is best avoided, as it conveys no impression that the disease is the result of invasion by the tubercle bacillus.

Symptoms and Signs.—In uncomplicated cases the symptoms are very indefinite. A typical case is where there is some concomitant infection of the intestines, and then we have diarrhœa, with a certain amount of abdominal distress, slight rise of temperature, rapid and feeble pulse, and loss of appetite, with more or less pallor and emaciation.

It is to be remembered that we sometimes meet with enlarged glands in the abdomen of a child which are not tuberculous, but the result of some gastro-intestinal irritation resulting in diarrhœa. Again, they may be found enlarged in malignant disease and in syphilis. In such cases we must not mistake them for the condition we are at present describing.

Most people imagine that enlarged glands are readily palpated in the abdomen, but this is a most erroneous view. Not only is it often impossible to satisfactorily palpate the abdomen owing to its distension in these cases, but even when the walls are soft the glands usually lie very deeply and may be missed. They are usually small, and are best detected by careful palpation of the abdomen with previously warmed hands. Deep pressure is necessary in most cases; and, even under the most advantageous circumstances the physician may fail to make out their presence. The abdomen is often sensitive in such patients, and too great care cannot be taken during its manipulation lest the child resent future examinations of a similar nature. In some cases a rectal examination will reveal the presence of enlarged mesenteric glands when all other methods fail to do so.

Very often in these cases the abdomen is much distended, while the veins stand out prominently on its surface. Diarrhœa is a fairly constant symptom, and it

should be carefully borne in mind that so long as this lasts there is little hope of alleviating the adenitis, as the latter is often started by the irritation of the intestinal canal.

Prognosis.—This is, in the majority of cases, favourable as regards complete recovery. Should, however, complications be present, the prognosis ought always to be guarded, especially where such concomitant lesions as enteritis and peritonitis are in evidence.

Treatment.—Gentle inunction with mercurial ointments generally yield the best results. We have also seen great benefit derived from the use of ichthyol-vasogen (10%) gently rubbed into the abdomen. So much for the local treatment; but more must be done if we desire to cure the patient. Diet in all cases must be light and nutritious, and should consist principally of milk and eggs with cream. Cod-liver oil, with or without malt, may be given in complicated cases. If diarrhœa is present this should be checked as quickly as possible. We have always found ichthoform one of the most valuable agents in these cases as it is readily taken, and has both an antiseptic and an anti-inflammatory effect upon the intestinal tract.

Pure air is very necessary, undoubted benefit being usually derived from residence at the sea-coast; and at all times the abdomen and lower part of the body generally must be carefully protected against chills. The parents must be warned to attend to any slight gastro-intestinal disturbance, as nothing hinders complete recovery so much as disorders of the stomach and intestines.

ASCITES.

Before concluding this section we shall give a list of the principal causes of ascites in children. Further in-

formation regarding these will be found under their appropriate headings.

1. Cardiac Disease.
2. Pulmonary Disease, *e.g.* chronic pleurisy and chronic broncho-pneumonia.
3. Renal Disease, *e.g.* nephritis; sarcoma.
4. Hepatic Disease, *e.g.* cirrhosis.
5. Tuberculous and Non-tuberculous Peritonitis.
6. Pernicious Anæmia and Leukæmia.

These are, of course, only a few of the more important causes, but they include the commoner conditions in which ascites is present. The differential diagnosis is sometimes difficult, and it is a wise measure to have the bowels thoroughly emptied by means of an enema, and then to make a very careful examination by the rectum in all doubtful cases.

DISEASES OF THE LIVER.[1]

Catarrhal Jaundice—Gastro-Duodenitis.

This is a much less common affection in children than in adults.

Etiology.—It is usually secondary to gastric catarrh, the inflammatory process extending along the common bile duct. It may, however, occur during the course of influenza, scarlatina, smallpox, and other infectious fevers. It has also been met with in epidemic form.

Symptoms.—The condition is ushered in by gastric disturbance as a rule. There is vomiting associated with either constipation or diarrhœa, and pain in the epigastrium. Jaundice develops sooner or later. The patient may then, if old enough, complain of headache, and he

[1] Only one or two of the more important can be considered.

gradually becomes listless and drowsy, though at times he may be very cross and fretful. The temperature is often slightly raised. The stools are clay-coloured and pasty, while the urine has a characteristically greenish brown colour. The pulse is not usually slow, although it is stated to be so in text-books. The coloration of the skin may not be detected in artificial light—a point of some importance in diagnosis.

Treatment.—As a rule these patients recover quickly under appropriate treatment, which should consist of restricted diet and mercurial purges. The most suitable diet is one of milk either plain or, if necessary, peptonised, with perhaps the addition of one of the malted foods, chicken broth, and beef juice. Hydrarg. subchlor. should be given preferably in small repeated doses, and in addition Vichy water. A few grains of sod. bicarb. are often a useful adjunct to the mercurial treatment, and the following powder is a favourite :—

℞ Hydrarg. Subchlor. . . . . gr. ss.
Sod. Bicarb. . . . . grs. iii.
Bismuth. Carb. . . . . grs. iss.

Fiat pulv. Mitte tales xii.

Sig.—One to be taken every 3, 4, or 6 hours (according to age and severity of the case).

Hepatic Cirrhosis.

At first sight it may seem somewhat remarkable that we should devote some space to the consideration of this condition to the exclusion of others which may be regarded as less uncommon. We have it, however, on the highest authority that hepatic cirrhosis in children is by no means a rare disease, though perhaps it is less frequently met with in this country than abroad.

Varieties.—These are really two in number: (1) Atrophic, and (2) Hypertrophic; and the pathological changes met with are somewhat similar to those seen in adults.

Etiology.—It is usually stated that this disease is most frequently met with in children between the ages of 9 and 12, and that boys are more liable to hepatic cirrhosis than girls. Alcoholic habits in parent or child will produce it, and this is a fact which must not be lost sight of, especially where we are treating a child for some organic disease by means of alcoholic stimulants. Next to alcohol may be placed malaria and syphilis. Less important causes are rickets, tuberculosis, and the exanthemata. Many writers on the subject lay stress on digestive disturbances as a factor in its production.

Symptoms.—These include a slight degree of jaundice, vomiting with diarrhœa or constipation, associated with progressive emaciation and ascites. The abdomen is distended and the veins on its surface are prominent. Hæmatemesis and epistaxis are common, and melæna may be observed. Pain is not often present, but it may be brought out during palpation over the liver. Various complications may occur, such as pneumonia and peritonitis.

Prognosis.—These cases prove fatal eventually, as treatment seems to have little effect in completely checking the progress of the changes going on in the liver in this disease.

Treatment.—A milk diet with saline purgation, and, in syphilitic cases, the administration of iodides may do good for a time. Ascites may necessitate drainage by means of Southey's tubes or the employment of diuretics and cathartics. Otherwise little can be done for these

patients beyond the use of expectant and general measures.

Other liver conditions which may be met with in children are Syphilis and Tuberculosis, Abscess (associated with the presence of hydatids), Acute Yellow Atrophy (one case of which has been reported as occurring in infancy), and Malignant Disease. Fatty and Waxy changes are of purely pathological interest.

DISEASES OF THE PANCREAS.

The recent literature on diseases of the pancreas takes but little notice of their occurrence in children. That pancreatic disease is met with in early life is now a matter thoroughly established beyond all doubt. Thus hæmorrhagic pancreatitis has been reported as occurring in infancy, while various inflammatory and suppurative cases have been recorded by competent observers. These cases are difficult to diagnose; but much help may be obtained from a careful examination of the urine, the "pancreatic reaction" being present in most cases. Tuberculosis and syphilis of the pancreas are not likely to be diagnosed during life, and are therefore of very little clinical interest. Cancer of this organ has been met with in children, but it is a very rare condition.

We have devoted a paragraph to the mention of these diseases of the pancreas as there is a risk lest this organ be absolutely ignored in considering the diagnosis of difficult abdominal cases. The pancreas is probably as important an organ in the child as in the adult, and doubtless many of its diseases pass unnoticed simply because the clinician has omitted to consider them as possible causes of the conditions presenting themselves for diagnosis and treatment.

CHAPTER IX.

DISEASES OF THE GENITO-URINARY SYSTEM.

NEPHRITIS.

It is not our intention to trouble the reader with details regarding the pathological anatomy of kidney affections. This part of the subject is best studied in the post-mortem room, as one must see the various conditions in the fresh specimens to thoroughly understand them. For the sake of simplicity we have regarded Nephritis as of two kinds, Acute and Chronic, and these we shall now describe.

1. Acute Nephritis.

Etiology.—The most frequent causes of acute nephritis are scarlatina and diphtheria. It makes its appearance in scarlatina towards the end of the fever and during the desquamation stage of the disease. It may also be met with in cases of acute rheumatism, varicella, measles, and in tuberculous affections. The administration of potassium chlorate may induce it, as may also certain other drugs. Purpura has recently been adduced as a cause of acute nephritis. Unlike adults children rarely, if ever, contract nephritis from exposure to cold and wet or from the taking of alcohol.

Symptoms.—Cases of acute nephritis do not always present the same symptoms. We may, for convenience,

classify the cases under three groups according to the symptoms to which they give rise.

(1) *Cases in which the Symptoms are Masked.*

In scarlatina and in diphtheria the onset of nephritis is often most insidious, and may escape detection altogether. It should, therefore, be a standing rule in such cases to examine the urine from day to day. It is only by doing so that the onset of nephritis can be diagnosed at the earliest possible opportunity, for the presence of a severe infectious fever will, by its own high temperature and other important signs, entirely obscure those of the superadded disease.

(2) *Cases in which Renal Symptoms are Prominent.*

The disease is here ushered in by a rapid rise of temperature with vomiting and, usually, constipation. The tongue is coated, the pulse rapid, and the breathing hurried. There is usually puffiness of the face and some swelling of the lower limbs. Pain over the kidneys may be complained of, and on examination of the urine, which is scanty and smoky in appearance, albumen and blood are detected, while the urea is found to be diminished. Casts can usually be made out, especially if the urine is centrifuged. In some cases of nephritis occurring in boys there is marked œdema of the penis and scrotum which may occasion much distress.

(3) *Cases in which Nervous Symptoms are Specially Marked.*

Here the disease starts with convulsions. The child becomes restless and delirious. Spasmodic twitchings of the limbs may be noticed, and eventually the patient

becomes comatose. Such cases are often extremely puzzling until a careful examination of the urine has been made, when typical changes are found to exist, and then the diagnosis becomes evident.

No matter how nephritis may come on, it is always a serious affection and liable to be attended by such grave *Complications* as pulmonary œdema, acute dilatation of the heart, and broncho-pneumonia.

In any case it should be remembered that acute nephritis does not always produce albuminuria, at least not at the start; and it requires more than ordinary watchfulness to make a correct diagnosis in such cases, which are by no means rare in practice.

Prognosis.—It is very often stated that children with acute nephritis have a better chance of recovering completely than adults. This is not quite accurate. Young children often succumb to this disease; while, if they recover, the urine rarely remains in a healthy condition. Many cases of adult albuminuria are no doubt to be referred to a previous attack, perhaps unrecognised, during the period of early childhood. At the same time there are patients who *apparently* recover completely, or who (to put it otherwise) present no renal symptoms after convalescence has been established.

Treatment.—Prophylaxis is most important. All cases of scarlatina and of diphtheria should be assiduously nursed. The skin must be made to act freely, while the bowels should be evacuated daily. In this way the work of the kidneys is diminished. Dieting should likewise be attended to; and the patient should not be allowed to get out of bed too soon. The actual treatment of the disease is to be conducted on practically the same lines as in the case of adults. The diet must consist entirely of milk,

whey, and chicken broth. Barley water may be added to the milk, or one of the malted foods. The bowels must be kept acting freely by means of hydrarg. subchlor. alternated with sod. sulph. For older children one of the mineral waters, such as Friedrichshall, may be substituted with advantage. The skin must be made to act by keeping the patient between blankets, and administering full doses of liq. ammon. acet. every three or four hours.

Complications must be treated as in the adult. During convalescence anæmia must be combated by means of iron, and by a prolonged sojourn in a warm, dry climate. Uræmic symptoms are best treated by active purgation and vapour baths. On no account must pilocarpin be given, as it is a very risky drug, and one which may produce sudden pulmonary œdema.

2. Chronic Nephritis.

This is by no means the rare affection of childhood that some suppose it to be. It may not be so frequently met with in children as in adults, but still it presents itself, more especially in the later years of childhood.

Etiology.—The most frequent cause is a persistence of renal mischief brought on, it may be, some years before, during an attack of one of the infectious fevers. Gout is also mentioned as a cause, while purpura is said to give rise to chronic nephritis.

Symptoms.—These may not be at all well marked, Headache and vomiting are usually present, but these do not usually suggest the presence of renal disease. Anæmia and emaciation are often associated. The urine is usually pale and of low specific gravity, while a few casts will be found on careful examination. Albumen, if present, is often scanty; indeed in the majority of cases

it is altogether absent. A brownish pigmentation of the skin has been described as occurring in some cases. Uræmia with its attendant phenomena may show itself sooner or later in the course of this disease.

Prognosis.—This is always grave, as such cases probably never recover completely, while many are cut off early by some other disease.

Treatment.—Dieting must be rigidly carried out. Milk, meat broths, chicken, fish, mutton in small amounts, and vegetables should form the chief elements of the diet. The skin and bowels must be attended to. Warm clothing, moderate exercise, and residence in a warm climate are essential. The following tonic usually does good:—

℞ Tr. Ferri Perchlor. . . . . ℥i.
Acid. Phosphor. Dil. . . . . ℥i.
Glycerini . . . . . ℥ii.
Inf. Quassiæ ad . . . . . ℥iii.
Misce. Fiat mist.
Sig.—℥ii. t.d.s. ex aq. p.c.

Vinum ferri may be substituted, but it is not by any means so efficacious, and moreover alcohol is best avoided altogether in this disease. Operative interference is still on its trial, and so far we are not in a position to make any dogmatic statement regarding its advantages, which are probably more fanciful than otherwise.

PERINEPHRITIS.

Mention is made here of this condition because it is so apt to be mistaken for hip-joint disease. Perinephritis is certainly not a very common disease, but when it does occur it usually produces pretty acute symptoms.

Etiology.—Like all inflammatory affections, perinephritis is due to invasion of the cellular tissue around

the kidney by micro-organisms. What these may be it is hardly possible to say, but probably in some of the cases attributed to cold, the bacillus coli and other organisms are in operation. Injury is usually given as one of the causes. Otherwise it may result from conditions of the kidney itself, such as pyelitis and tuberculous disease.

Symptoms.—There are two very prominent symptoms which are always present. These are pain and difficulty in locomotion. The pain may be felt in the lumbar region, but not infrequently it is more marked in the upper part of the thigh than elsewhere. The patient has great difficulty in walking, and always limps along, keeping the back rigid. The temperature is always elevated, though this need not be a very marked feature of the case. There is, as a rule, increased frequency of micturition, and the act may be accompanied by a certain amount of pain. Should suppuration set in and abscess formation result, a distinct tumour may be made out in the loin, and all the symptoms will then become aggravated.

It is important to diagnose such cases from hip-joint disease. This can only be done by careful estimation of all the symptoms. Perinephritis is more acute, while the nature of the deformity in hip-joint disease is sufficiently characteristic, every movement of the joint being more or less restricted, whereas in perinephritis the movements of the joint itself are comparatively free.

Prognosis.—Recovery is the rule, but the occurrence of suppuration renders the chances of recovery, apart from operation, very slight indeed.

Treatment.—The patient must be kept on milk diet. The bowels should be freely opened by means of a mercurial or a saline purge. The skin should be made to act freely. Locally pain is to be relieved by the applica-

tion of hot fomentations. Surgical measures are indicated whenever suppuration has taken place.

PYELITIS.

This is a most important condition, and one which may affect either one or both kidneys. It is to be regarded as a somewhat uncommon condition in children,[1] and is usually found occurring secondarily to some pre-existing renal disease.

Etiology.—It may be met with as a sequel to scarlatina, diphtheria, influenza, and certain of the other infectious fevers. It may also be found in connection with tuberculosis, tumours, and malformations of the kidney. Holt states that renal calculi is the most frequent source of local irritation, while two of Thomson's recorded cases were associated with infantile scorbutus, and a history of intestinal trouble is frequently obtained.

Symptoms.—These may be summed up in a very few words. The presence of recurring rigors in a child who is passing very acid urine which contains pus is most suggestive. In addition there may be some pain on micturition. Local tenderness may be made out, but this is naturally difficult to make sure of, especially in very young children.

Prognosis.—In uncomplicated cases recovery is usually comparatively rapid. The risk in pyelitis is a spread of the inflammatory process to other parts of the kidney.

Treatment.—The urine being extremely acid, the indication is to render it alkaline. The drug found most useful for this purpose is potassium citrate, which should be given in doses of from 2 to 4 grains every four hours.

[1] Like many other diseases of childhood pyelitis may not be so rare as we are apt to suppose. Probably it often escapes detection.

It is apt to cause considerable depression, but this soon passes off. Abundance of barley water should be given at the same time. Nephrectomy will become necessary when the symptoms indicate the onset of pyæmia.

RENAL CALCULI.

These are usually small in size, and as a rule are composed of uric acid. Their presence may give rise to pyelitis, or even to pyelonephritis and pyonephrosis. Otherwise, renal colic is the chief condition with which they are associated.

Symptoms.—The presence of a calculus in the kidney may give rise to pain on micturition, while the urine may contain blood, pus, and uric acid crystals. There may be pain on palpation over the kidney, and retraction of the testicle on the affected side has been noticed. When the calculus passes along the ureter a typical attack of renal colic is produced.

Treatment.—Attempts may be made to dissolve the calculus. For this purpose large quantities of alkaline water should be administered, and all red meat and irritating material excluded from the diet. Piperazin and urotropin are of but little value as solvents of uric acid, and certainly we have found alkaline mineral waters much more efficacious. Surgical interference is always necessary in the severer cases where renal colic tends to recur, and where the other symptoms show no sign of abatement.

MALIGNANT DISEASE OF THE KIDNEY.

We shall merely consider Renal Sarcoma under this heading, as other tumours of the kidney are excessively

rare. Moreover, it is the most frequently met with abdominal tumour in children. These sarcomata are usually of the round-celled variety.

Symptoms.—In most cases a painless tumour is found in the lumbar region. This tumour grows fairly rapidly, and has the colon in front of it. A solid tumour occupying this situation in a young child is almost certain to be a sarcoma of the kidney. The urine usually contains blood, but a large amount of hæmaturia must not be looked for in every case. As time goes on the abdomen becomes enormously enlarged, while the patient becomes more and more cachectic looking. Respiration may be interfered with from mechanical obstruction, while swelling of the ankles is often seen. The other kidney may become involved, or deposits may occur in other organs and tissues.

Prognosis.—Without operation these patients succumb within a very short time. The operative treatment, however, gives a fair degree of hope.

Treatment.—Nephrectomy should be performed as soon as the diagnosis has been established, provided the other kidney is healthy. The results of this operation in young children are wonderfully successful, at least in the hands of an experienced operator.

Lipoma, adenoma, and carcinoma of the kidney are exceedingly rare, and therefore they need not further be referred to.

POLYURIA.

We prefer this term to that of Diabetes Insipidus, which is apt to suggest the presence of sugar in the urine to the student's mind. It differs from Diabetes Mellitus in two points, and agrees with it in two re-

spects. In polyuria there is no sugar present, and the specific gravity of the urine is extremely low. Like true diabetic patients, those affected with polyuria pass enormous quantities of urine, and complain greatly of thirst.

Etiology.—This is not by any means a common disease of childhood. When it does occur there is usually a history of neurotic tendencies in the family. Injuries to the head and exhausting diseases may lead up to it, while syphilis may be a predisposing factor.

Symptoms.—The patient passes large quantities of pale, limpid urine of low specific gravity (1001 to 1005). The urine contains no abnormal constituent, and sugar is notably absent. The usual complaints are frequency of micturition and great thirst. The patient is apt to be fretful and irritable. In course of time he becomes pale and thin, with dry skin and other evidences of malnutrition.

Prognosis.—This condition is apt to become somewhat chronic. Many cases, however, recover completely under proper treatment. Death may result from exhaustion and grave anæmia.

Treatment.—Most of these cases get well without drugs. The diet should be light and nutritious. Too much starchy food and all sweetmeats must be scrupulously forbidden. Alkaline waters may be given to allay the thirst. The only certain remedies are strychnine and alkaline tonics combined with vegetable bitters, such as gentian. Bromides are sometimes of service where there is a strong neurasthenic element present.

This condition of polyuria must not be confounded with that known as **Irritable Bladder**. The latter affection is most often met with in girls. These patients have a

constant desire to micturate, but they never void much at a time. There is often considerable pain associated with it, but many cases within our own knowledge have had but one symptom, viz. frequency of micturition. It may be the result of hysteria or of simple nervousness, while at times an excessively acid urine leads to its development. The treatment consists in combining small doses of sod. brom. with tinct. hyoscyami. If this does not afford relief, the bladder, rectum, and pelvic viscera generally must be looked to, as local disease of these parts may be found associated with this phenomenon.

GLYCOSURIA AND DIABETES MELLITUS.

By the term **Glycosuria** is meant the *ephemeral* presence of sugar in the urine. It is usually brought about by the dieting of the child, and in many cases the variety of sugar met with is lactose. At times, however, glucose is found, and great care must be taken lest such cases are mistaken for true diabetes.

Diabetes Mellitus is extremely uncommon in children, though when it does occur it is apt to prove a most intractable disease, and one regarding which the prospects of cure are not at all hopeful.

Etiology.—The condition may be met with congenitally. At all events cases have been recorded in which glucose was present in the liquor amnii. We recently noted[1] the presence of sugar in the urine of a multipara with hydramnios, but this was a purely transient condition, and probably most of the other recorded cases were of a similar nature. There is often a strong hereditary element in cases of diabetes mellitus occurring during infancy and

[1] Vide *The Lancet*, March 28, 1903, p. 882.

childhood. Syphilis and alcoholism in the parents may also predispose to it. Head injury may induce it. Otherwise it is somewhat difficult to assign a cause to this affection.

Symptoms.—Many patients die after a very short illness in which feverishness with thirst rapidly leading on to coma are the only symptoms observed. It is scarcely correct to say that patients usually live for some months and even years, as these cases are quite exceptional.

"Incontinence of urine is an important symptom, and often one of the earliest to be noticed," but, unfortunately, incontinence is apt to be attributed to other causes, the urine is rarely examined, and so the case is allowed to drift on. The patient passes large amounts of pale urine of high specific gravity (1030 to 1045), which always contains glucose in varying amounts. Intense thirst is complained of, while increased appetite is not infrequently noticed. The skin becomes dry and harsh, the tongue is red, and the child rapidly emaciates. Boils are commonly met with, and the patient is usually restless and cross. Occasionally pneumonia develops, but the rule is for coma to supervene in these cases.

Prognosis.—Few of these patients recover. Most of them die early with coma. Cases said to have recovered or to have lingered on for years were, in all probability, cases of simple glycosuria.

Treatment.—Diet is the sheet-anchor here. This should consist largely of milk, eggs, butter, cream, and broths. Bread and biscuits made from potatoes (as suggested by Sir James Sawyer of Birmingham) may be given, but our experience has been that these are not very acceptable to children. Saccharin may be given instead of sugar. There is always a tendency for the parents and

nurse in such cases to give the child chocolates and other sweets, but these must naturally be entirely forbidden. The difficulty is to find a bread-stuff sufficiently free from starch and yet palatable.

Of drugs we cannot speak very favourably. Aspirin and sodium salicylate are of use in some cases, but not in all; while opium is not a very safe remedy to administer to children. Above all things we would enjoin the importance of giving the patient abundance of alkaline drinks at frequent intervals.

ENURESIS.

Incontinence of urine may be met with in the form known as "bed-wetting," in which the child cannot control his bladder sphincter while asleep, though he can do so while awake and going about. In other cases this want of control is exhibited at all times, and not merely when the child is in bed.

Etiology.—Too much importance cannot be attached to the necessity for the frequent examination of the urine in children. This is seldom carried out in the same routine manner as in adults, and consequently many pathological conditions remain unrecognised.

To emphasise its importance as a cause of enuresis we place diabetes mellitus first. Next we would mention the presence of worms in the rectum and stone in the bladder. These are, perhaps, the least common of all causes, but on this account they should not be overlooked.

Highly acid urine, neurasthenia, rachitis, anæmia, general malnutrition, and gastro-intestinal disorders are very commonly associated with incontinence of urine. In some instances an examination of the rectum will reveal

the presence of a polypus, while phimosis may be the principal element in the case. Occasionally it has been known to result from grave cerebral disease.

Treatment.—The cause must be diligently sought for in every case. We fear there is too strong a tendency to give a prescription for belladonna, and trust to chance for the rest. Such treatment is, to say the least, unscientific, and destined to prove futile in the long run.

In most cases the diet should consist of milk, eggs, fruit, chicken, and fish. Alkaline waters should be given to drink. Constipation must be strenuously avoided, and strict attention paid to the general hygiene of the child. Douching of the spine followed by thorough drying is essential. The child should have no fluid before going to bed, and the bladder should be thoroughly emptied before he goes to sleep.

Tonics are generally very useful, more especially strychnine combined with malt. Belladonna in the form of the tincture is an old favourite, and may be given in doses of 5 minims, or more, three or four times a day. In neurasthenic children it may be combined advantageously with 5 grain doses of sodium bromide.

The statement that removal of adenoids, when present, has resulted in the cure of incontinence must be taken with some reserve.

PHIMOSIS.

This condition deserves mention here as it is so extremely common. It is frequently associated with elongated prepuce. A certain degree of phimosis is present in nearly every male infant. This tightness of the prepuce varies in degree, but it is usually never so

great as to prevent the glans from being visible after the parts have been manipulated as described below.

It is stated that this condition is apt to produce a variety of nervous phenomena, but this is very questionable, as we have time after time known infants with undoubted phimosis who were perfectly normal in every other respect. The risks of phimosis are due to the straining it produces during the act of micturition, as this may readily induce hernial protrusion through the inguinal ring. Phimosis may also, it is said, lead to grave renal disease. Incontinence of urine is very apt to be associated with it, though in many cases the enuresis is due to other causes altogether, even when phimosis is present.

The treatment by circumcision is all too common. Few children really require to be circumcised, and the operation is, in our opinion, far too frequently performed at the present time. Most cases are relieved by simple dilatation with a pair of dressing forceps, and subsequent daily retraction, aided by the application of a little olive oil. It must not be forgotten that Nature herself will complete the cure when the child is older. Moreover, the operation of circumcision requires considerable care, as it is not altogether devoid of risks.

UNDESCENDED TESTICLE.

This condition may sometimes be relieved by operation, but in any case it is unwise to remove it entirely, as even a retained testicle doubtless possesses an internal secretion the loss of which may prove detrimental to the nutrition of the patient. Children with retained testicle (unilateral or bilateral) often complain of pain in the inguinal region.

This is usually relieved by hot bathing and free purgation. This source of pain should not be overlooked, nor the retained testicle mistaken for a hernia.

VESICAL CALCULUS.

Like renal calculus the commonest variety met with in the bladder is the uric acid one. Vesical calculus is by no means a rare condition, though its presence is often unrecognised.

The chief *Symptoms* are incontinence of urine and habitual tugging at the foreskin by the patient. Occasionally the flow of urine is suddenly interrupted; and usually there is more or less rectal irritation which may amount to actual pain. Pain on micturition is not a very prominent symptom, while hæmaturia is very rarely observed.

Apart from the use of the sound in diagnosis, the X-rays will often prove very useful in making out the presence of a calculus in the bladder.

The *Treatment* adopted may be either lithotrity or suprapubic incision.

VULVO-VAGINITIS.

Of the ordinary *Catarrhal* form the chief causes are anæmia, especially when this is the result of measles and other infectious fevers, and worms. Lack of cleanliness may produce it, or at all events aggravate the condition when already present.

One of the commonest causes of this condition is the habit young children have of sitting about on the floor, and in the poorer classes of rolling about on the

pavement. In this way micro-organisms readily obtain an entrance.

The discharge is extremely acrid, and the parts affected are always inflamed and very sensitive. The condition has to be diagnosed from the *Gonorrhœal* form, and **this can only be done by the bacteriological examination of the pus.**[1] Microscopic examination alone does not afford conclusive evidence.

The *treatment* of vulvo-vaginitis consists in strict attention to cleanliness. The parts must be flushed two or three times a day with corrosive lotion (1 in 5000), or with boric acid lotion (10 grs. to the oz.). In most cases tonic treatment must be used in addition. Malt and iron, abundance of fresh air, and douching of the spine are valuable aids in the treatment of this affection. Gonorrhœal cases require no special measures beyond these, though great care must be taken lest the eyes become affected. Where the simple lotions mentioned fail to bring about a cure it may be found necessary to use a weak solution of ichthargan, or acetozone may be tried.

[1] This fact cannot be too strongly impressed upon the minds of practitioners. Gonorrhœal vulvo-vaginitis would be a very common disease indeed if we were merely to accept the evidence afforded by microscopic examination of the discharge.

CHAPTER X.

DISEASES OF THE BLOOD, SPLEEN, LYMPHATIC AND OTHER GLANDS.

DISEASES OF THE BLOOD.

ANÆMIA.

Apart from Pernicious Anæmia and Chlorosis every variety of anæmia may be regarded as secondary to some pre- or co-existing condition. These Secondary Anæmias, as they are termed, are very frequently met with amongst infants and children. Pernicious Anæmia, on the other hand, is but seldom seen; while Chlorosis is usually only met with in girls at puberty.

1. Secondary or Simple Anæmia.

In this group the blood is altered in most of its constituents. The red blood corpuscles are reduced in number, while the hæmoglobin is usually diminished proportionately. The specific gravity is lowered to a certain extent, and there may be a slight increase in the number of leucocytes. The spleen may or may not be enlarged, this hypertrophic condition being entirely due to the cause at work in producing the anæmia.

Etiology.—Anæmia is very readily induced in children. Accordingly we are not surprised to find that lack of fresh

air and hygienic surroundings, bad feeding and consequent gastro-intestinal disturbances, rapidly induce a condition of anæmia which may assume a very severe type. Acute rheumatism, heart disease, and renal affections are potent factors in the production of anæmia, as are also the acute infectious fevers. Other causes requiring mention are tuberculosis and syphilis, rickets, purpura, and scorbutus, together with all wasting diseases.

Symptoms.—There is always pallor, especially of the gums and conjunctival mucous membrane. The child is usually fretful and restless, sleeping badly. The bowels are apt to be constipated, the tongue furred, and the appetite poor. The history of some pre-existing or concomitant disease, however, affords more help in arriving at a correct diagnosis than do the symptoms.

Prognosis.—This is always less favourable the younger the child. The cause, however, influences the prognosis in any given case. The more marked the change in the condition of the blood, other things being equal, the less likely is recovery to take place.

Treatment.—Attention must be given to the feeding and housing of the child. The clothing must be warm and clean. Fresh air and sunlight are essential. Iron is usually indicated, but we would carefully warn our readers not to resort to iron preparations in every case where there is pallor present. Thus if the case be due to rickets, cod-liver oil and not iron should be given; if gastro-intestinal conditions be present these must be corrected. Very often an alkaline mixture will cure the anæmia due to chronic indigestion when iron salts would only aggravate the condition. For children the best preparations of iron to give are the saccharated carbonate and reduced iron. Vinum ferri is a useful preparation in many instances,

but is, in our opinion, too poor in the amount of contained iron to be of much therapeutic value in the severer cases.

2. Chlorosis.

We need not take up our somewhat limited space in considering this form of anæmia, as a description of it is to be found in every standard text-book on Medicine. We may mention here, however, that in many cases chlorosis seems to be the result of an hereditary predisposition, and is more frequently met with in the children of neurotic parents than in others.

3. Pernicious Anæmia.

This being a very rare condition in infancy and childhood we need not linger over it. Suffice it to say that occasionally the severer forms of simple anæmia become eventually pernicious in type when left untreated. In this disease arsenic is the drug which affords the best results.

4. Anæmia Splenica Infantum.

This seems to us, in the present state of our knowledge regarding this disease, a much better term than that of pseudo-leucæmic anæmia of infancy which is usually, but somewhat incorrectly, applied to it.

In this disease the blood is very greatly altered in character. The red corpuscles and hæmoglobin are reduced, the latter often very markedly, while the specific gravity is also distinctly decreased. The red corpuscles are not only diminished in amount, but their size and shape are materially altered. There is a leucocytosis which may be very pronounced. With all these changes

we find the spleen enlarged so that its weight may be greatly increased (in one case it was nearly 2½ lbs.)

Etiology.—It is certainly most frequently met with during infancy. Micro-organisms are believed to be the essential cause by some writers, but as yet there is very little evidence to support this view. Syphilis and rachitis have been found in association with this disease, but whether they are the actual causes we are not in a position to state with any degree of certainty.

Symptoms.—The symptoms are in general those of ordinary simple anæmia, together with marked splenic enlargement. Otherwise the diagnosis is usually only possible after a careful blood examination. The liver may be enlarged as well to a certain extent, while hæmorrhages are frequent. The two most prominent symptoms undoubtedly are a waxy pallor of the skin coupled with enlargement of the spleen. Care must be taken not to confound such cases with secondary anæmia, leukæmia, and rachitis, to all of which it may bear a very close resemblance.

Prognosis.—This is usually very grave, as the age of the patient is not such as to afford much resistance to a disease in which the blood is so greatly altered in quality.

Treatment.—Of this little can be said, except that the anæmia must be treated on general principles, while any coexisting disease must be dealt with. Iron and arsenic are always prescribed, but whether they are of any great value is at present somewhat uncertain.

LEUKÆMIA.

The spleno-myelogenous form of this disease is rarely met with in young subjects. On the other hand the

lymphatic form presents itself with considerable frequency. As yet no work of any magnitude has been done in connection with the leukæmia of infancy and childhood. Consequently any description we might give of the blood would be practically similar to that given in any text-book of general medicine, and need not therefore be repeated. It is noteworthy that leukæmia bears a certain relationship to lymphadenoma and to the splenic anæmia of infants already referred to.

Etiology.—Males are much more liable to this disease than females. It may occur in the course of congenital syphilis, of rickets, and of some other constitutional diseases; but very often it comes on independently of any pre-existing condition.

Symptoms.—Enlargement of glands may be the first sign to be observed. In other cases epistaxis or hæmatemesis, or even petechiæ, may afford the earliest hint as to the existence of the disease. Pallor, dyspepsia, diarrhœa, and dyspnœa are leading symptoms; while, in the spleno-myelogenous form, the abdomen is usually enlarged owing to the hypertrophy of the spleen. The temperature is often slightly elevated, but this is better marked towards the termination of the case than at the commencement of the disease.

Prognosis.—Unfortunately there is little hope of recovery. Leukæmia usually proves rapidly fatal, though occasionally the disease assumes a somewhat chronic type.

Treatment.—Iron and arsenic may be tried. In the lymphatic form it seems worth while trying inunctions of mercurial ointment, more especially in those cases which possess a syphilitic history.

LEUCOCYTOSIS.

This means an increase in the number of the polynuclear leucocytes more especially. It occurs in a large variety of conditions, and may prove of considerable value from a diagnostic point of view. We may mention in particular appendical abscess, acute rheumatism, many cases of diphtheria, and acute non-tuberculous meningitis. In tuberculous meningitis the number of leucocytes present in the blood is practically normal, and hence we have a means of diagnosing this from the non-tuberculous form. Rachitis is usually accompanied by distinct blood changes of which leucocytosis forms a marked feature. Osteomyelitis is also characterised by an increase in the number of leucocytes, while septic conditions generally present a similar blood change. Pneumonia is readily distinguished from enteric fever by examination of the blood, as the former disease presents leucocytosis whereas the latter does not.

CHLOROMA.

This disease is usually regarded as a variety of sarcoma in which the tumour masses present are of a yellowish green colour. There is a certain amount of evidence to show that this affection is in some respects a form of leukæmia, and hence we have thought it advisable to give a short account of it here.

Etiology.—There is often a family history of tuberculosis or of syphilis, while the patient frequently has a previous history of ill-health. In some of the recorded cases the child had just recovered from an attack of measles or some other infectious disease.

Symptoms.—Apart from general ill-health the presence

of distinct swellings about the face, especially in front of the ears, the temporal ridges, and malar regions, are most characteristic. These cause pain on movement as in eating. The patient is always more or less emaciated and pale. The temperature may be raised, and the pulse is usually somewhat rapid and very feeble. The red corpuscles are diminished; but the most striking feature is the increase in the number of leucocytes, especially the lymphocytes. The polynuclear leucoctyes are usually unaltered in number. The spleen is often enlarged, and may present a certain degree of localised peritonitis.

Prognosis.—Nothing can as yet be done to avert a fatal termination. The loss in weight is usually very rapid, and the patient's strength also rapidly fails.

Treatment.—Beyond the free administration of stimulants little can be done in these cases to alleviate the condition. Feeding is often difficult owing to the pain which it occasions.

PURPURA.

This is a term which has been applied to quite a variety of conditions, all of which are characterised by hæmorrhages which occur into the skin or from the mucous membranes. Four varieties are met with, and these we shall now describe in turn.

1. *Purpura Simplex.*—This form occurs under quite a variety of conditions. It is characterised by the presence of petechiæ, associated with slight rise of temperature and a certain amount of gastro-intestinal disturbance. It is particularly apt to occur in certain of the infectious fevers and in exhausting diseases such as pneumonia and endocarditis; and in many of these cases it assumes the hæmorrhagic type.

2. *Purpura Hæmorrhagica.*—In this variety hæmorrhages occur not only into the skin, but also from the various mucous surfaces. Bleedings from the nose, gums, stomach, and bowels are common, and the petechial eruption may be extremely large and well marked. These hæmorrhages tend to produce a profound degree of anæmia, and the temperature is raised. In the worst cases there are cerebral symptoms present. Gangrene occasionally supervenes.

3. *Purpura Rheumatica.*—The symptom group presented by this variety is quite typical. We find swellings of certain joints (usually the ankle and knee) associated with a purpuric eruption, with perhaps epistaxis and hæmorrhages from other mucous membranes.

4. *Purpura Henochii.*—This variety was first described by Henoch in 1874. It is characterised by pain with or without swelling of joints, a purpuric eruption, vomiting, intestinal hæmorrhage, and colic. There is always a certain degree of abdominal tenderness present. The temperature is usually only slightly raised. It may be complicated by acute nephritis. Relapses form a distinct feature of Henoch's purpura. These occur at intervals, it may be of days, weeks, or even longer periods.

We are now in a position to refer to the prognosis and treatment of purpura as a whole.

Prognosis.—This is usually favourable except in very young children where the amount of blood lost has been excessive. Bad symptoms are extreme prostration, rapid rise of temperature, and evidence of cardiac failure.

Treatment.—The patient must be kept absolutely quiet in bed. Adrenalin may be tried. The patient's strength must be carefully supported throughout the progress of the disease. In Henoch's purpura an ice-bag should be

applied to the abdomen, and iced milk given to the patient.

DISEASES OF THE SPLEEN.

Apart from its enlargement in enteric fever, and in rachitis, syphilis, tuberculosis, and in certain blood diseases, the spleen presents very few pathological conditions in childhood of any clinical importance or interest.

Removal of the spleen has been performed successfully for simple hypertrophy in children, but it is a somewhat risky procedure, and one which is apt to be followed by considerable shock.

DISEASES OF THE LYMPHATIC GLANDS.

ACUTE ADENITIS

Acute inflammation of the lymphatic glands is of very common occurrence in infants and young children. The glands most frequently involved are those lying in the neck, although the suboccipital, axillary, inguinal, and other glands may be found affected.

Etiology.—Infants are especially liable to acute inflammation of the lymphatic glands. There can be little doubt that all such inflammations are the result of invasion by micro-organisms. In certain cases staphylococci and streptococci have been found, while diphtheritic, typhoid, and other bacilli have been isolated. Pediculosis capitis is a common cause of enlarged suboccipital glands. The submaxillary group are enlarged in conditions of the mouth and teeth. The cervical glands are affected when the ear and face are the seats of diseased processes, while in conditions of the throat and fauces as well as of the

nose the deep set is involved. The glands in the axilla may be enlarged in connection with mastitis and after vaccination. The inguinal glands are found enlarged in conditions affecting the genital organs such as vulvo-vaginitis and preputial irritation. Of the infectious fevers diphtheria, scarlatina, and measles must be mentioned as especially liable to give rise to adenitis.

When enlarged glands in the neck are met with the teeth, ear, throat, and nose should be carefully examined, as these are usually found to be the centres of disease in such cases.

Symptoms.—There is a swelling in one or other of the situations normally occupied by the lymphatic glands. This swelling is hard, and can be moved about quite freely under the skin. In outline it may resemble a pea, a marble, or in some cases it may even assume larger proportions. The temperature is often slightly raised, and in young infants the constitutional disturbance is often very marked. After a few days or weeks the swelling subsides. In other cases the gland remains chronically enlarged, and may even become the seat of a tuberculous process.

If suppuration occurs the swelling usually increases in size, and the temperature, more especially in infants, may rise to 103° or 104° Fahr. The skin over the abscess becomes red and shiny, while the mass below presents fluctuation. Unless relieved by surgical interference the abscess bursts externally, and may give rise to a chronic discharging sinus.

Treatment.—In every case the cause of the swelling should be carefully made out, and, if possible, removed. Pain may be relieved by inunctions of warm olive oil. Before suppuration sets in an attempt may be made to set up resolution by rubbing in mercurial ointment or by

painting with iodine. When suppuration occurs free incision is indicated as soon as possible. If necessary the broken down glandular tissue may be scraped, and the cavity swabbed out with pure carbolic acid. In all cases tonic treatment is indicated, and cod-liver oil with hypophosphites will be found very useful. A short holiday at the sea-side is specially valuable in cases occurring during convalescence from infectious fevers.

CHRONIC ADENITIS.

As a general rule chronic inflammation of the lymphatic glands is a tuberculous process; but it is also met with in syphilitic children, in lymphadenoma, and even in chronic inflammatory conditions of the throat, nose, ear, and other organs. So uncommonly, however, do we find chronic adenitis apart from tuberculous infection that we may well confine our attention to this particular form. The remarks which follow must therefore be taken as referring to tuberculous adenitis.

Etiology.—The tubercle bacillus is the real cause of this affection, though in some cases other organisms may be found present as well. Chronic adenitis is most commonly met with in children between the ages of five and twelve, and but rarely in infancy.

Not infrequently the adenitis is first seen after recovery from measles or scarlet fever. This disease is also very prevalent in children who have hypertrophied tonsils and adenoids. Very often dental caries forms the starting point of the glandular infection.

Symptoms.—One or more glands, usually the cervical, will be found enlarged. At first the swelling is small and hard, but it gradually increases in size. Later the infection

spreads to surrounding glands which in turn become enlarged. All this time the patient experiences little or no discomfort from the swelling. Sooner or later the gland breaks down and caseates, and this process may involve several glands at one time so as to form a large fluctuating mass. The skin over the caseating area is red and inflamed. It becomes thinned, and eventually gives way. Pus is poured out, and the result is a discharging sinus which eventually heals up, leaving a ragged and disfiguring scar. This process is usually met with in the cervical region, and it may involve both the superficial and deep glandular chains.

Prognosis.—Only in cases where the deeper sets of glands are involved is there any danger to life. Occasionally tuberculous adenitis gives rise to general tuberculosis, and therefore the treatment in every case must be directed to prevent the occurrence of this serious disease.

Treatment.—Children suffering from tuberculous adenitis must not be shut up in the wards of an hospital. They should be as much in the open air as possible, while sunlight is invaluable in such cases. Tonic treatment in the form of cod-liver oil with hypophosphites should always be given a fair trial. All sources of local irritation should be got rid of. Inunctions of mercurial ointment may be tried, but personally we prefer ichthyol-vasogen in these cases. Syr. ferri iodidi is praised by some writers, but we have never seen much improvement follow its use; and, moreover, it is very apt to disturb the appetite and digestion, which are rarely in a satisfactory state in this condition.

Operation must be resorted to when medicinal means fail, as they usually do, to produce diminution of the swelling. Excision and scraping are usually performed,

but for details of the methods employed the reader must refer to surgical text-books. The after-treatment, in any case, consists in removing the patient to the sea-side and in administering cod-liver oil for a somewhat prolonged period. Such children are often delicate, and require much care and attention for a long time, even after the disease has been entirely got rid of.

DISEASES OF THE THYMUS GLAND.

The Thymus gland is a structure peculiar to infancy. It extends from the lower border of the thyroid cartilage in the neck to the fourth costal cartilage in the superior mediastinum. It is to all intents and purposes a large lymphatic gland, and in the adult it is replaced by a mass of adipose tissue.

This gland is occasionally the seat of certain diseases of which the following are the more important:—

1. Syphilitic Gummata.
2. Tuberculosis.
3. Simple Hypertrophy.

The last-mentioned is the only condition of any special clinical importance. It rarely occurs in healthy infants, but rather in those who are rachitic or the subject of general lymphatic disturbance. In most of the recorded cases sudden death has occurred, often preceded by convulsions. The cause of death in these cases is said to be asphyxia, which has been variously attributed to pressure of the hypertrophied gland on the vagus or to pressure on the trachea or bronchi. Other observers maintain that death is due to cardiac paralysis resulting from pressure of the enlarged thymus upon the heart and main blood-vessels. In no case has treatment by tracheotomy and

artificial respiration proved at all beneficial or capable of preventing a fatal termination.

SPORADIC CRETINISM.

As this disease is associated with changes in the thyroid gland it will be convenient to describe it in this chapter, although it is often considered as belonging to diseases of the nervous system.

Condition of the Thyroid.—The thyroid gland is usually atrophied or absent, while in a few cases it may be the seat of a goitrous enlargement.

Etiology.—As a rule the disease is usually manifested in children between the ages of 2 and 15. Males and females are affected with equal frequency. The family history is usually excellent, the parents and other children being normal in every respect.

Symptoms.—The striking feature is the smallness of the patient's stature. The fontanelle remains unclosed, and the head is apt to resemble that seen in rachitic subjects. The neck is stumpy and thickened, while the skin over the body generally gives a solid œdematous feel to the touch, and is dry. The hair is coarse and often scanty. Such children are late in cutting their teeth and late in walking. Their speech is apt to be imperfect and thick. They are, as a rule, easily managed, being good-tempered and readily amused. Constipation is often a troublesome symptom, though in one case diarrhœa was a very constant feature.

Prognosis.—Now that thyroid feeding has been introduced these cases are exceedingly hopeful as regards amelioration and even ultimate cure.

Treatment.—Thyroid extract may be given either in

tablet form, or better still in the form of the powder known as iodothyrin. The latter is exceedingly satisfactory, and is usually found to give more rapid results than the ordinary extract. Of the extract ½ to 1 grain should be given two or three times a day, while from 2 to 3 grains of iodothyrin may be administered with the same frequency. In any case it is always advisable to begin with small doses, and gradually to increase the amount as tolerance of the drug becomes established.

Treatment must be prolonged for a somewhat indefinite period. After cure has been effected one, or at most two doses of one or other of these preparations should be given in the course of a week. It is well to advise the parents to continue the treatment without intermission lest relapse should occur.

CHAPTER XI.

DISEASES OF BONES AND JOINTS.

ACUTE OSTEOMYELITIS.

(Acute Arthritis of Infants.)

THIS disease is best termed osteomyelitis as the joint affection is usually secondary to infection of the bone and more especially of the medulla. Suppuration is usually present, and abscesses form in and around the affected joint. It is in reality a pyæmic process, so that secondary abscesses may be met with throughout the body.

Etiology.—This is essentially a disease of early infancy, though cases may be met with during the first years of life. In the majority of instances no cause can be assigned for the onset of the disease, while in other cases organisms obtain entrance to the blood through the umbilicus. It is possible that the throat may form the source of the mischief, and cases have been known to occur after scarlatina and measles. Injury is also said to be an important cause.

Symptoms.—A high temperature and marked local pain are two of the most prominent symptoms. The affected parts are swollen, red, painful, and very tense. Fluctuation can often be made out. The temperature is somewhat irregular, and the pulse is always rapid, while

the patient is seen to be more or less acutely ill and weak.

Prognosis.—Unless immediate surgical treatment can be obtained little prospect of recovery can be held out. Cases which recover under treatment seldom do so without serious alteration in the structure of the affected joint.

Treatment.—Prophylactic treatment of the umbilical wound during the first few weeks of life is of great importance. When the disease occurs surgical treatment affords the only chance of recovery Excision of the affected parts is necessary, followed by the maintenance of the joint in good position.

TUBERCULOUS JOINT DISEASE.

This is so essentially a surgical subject that we shall only refer to it very briefly. As a rule the history of some slight injury can usually be obtained in cases of tuberculous joint affection, and not infrequently primary disease of the bones forms the centre of infection.

1. Hip-Joint Disease.

Three stages are usually stated to be exhibited by this form of joint disease. In the *first stage* the bones forming the joint are alone involved. The child is noticed to limp slightly. There may be some tenderness about the joint. At night the child often wakes up with a startling cry of pain. These symptoms may be present for some months before the *second stage* is developed. In it the joint becomes invaded, and the pain increases. The patient can no longer bear his weight on the affected limb which becomes slightly everted and flexed. In the *third stage*,

which is that of deformity, we meet with marked atrophy of the muscles about the joint.

Diagnosis.—It is in the first stage more especially that difficulties of diagnosis arise. It may be mistaken for rheumatism, but the presence of paroxysmal pains during the night, together with a somewhat long-standing history of lameness and tenderness, suffice to distinguish early hip-joint disease from rheumatism, and indeed from most other conditions with which it may be confused.

Prognosis.—If seen early the case may be cured, and even if got in the second stage good results usually follow treatment. In the third stage the effects of treatment are rarely satisfactory. Apart from the condition itself these patients are apt to develop tuberculous disease elsewhere, which often renders the prognosis much less hopeful than it would otherwise be.

Treatment.—Apart from surgical treatment it is most essential that such children should be kept in the open air as much as possible. Hospital wards are not at all suitable places for these patients. Fresh air, sunlight, and cod-liver oil must be found for them. Their general hygienic surroundings ought to be the best possible obtainable, while diet must be nutritious and rich in fat.

2. Tuberculous Disease of the Spine.

This condition is often brought to the physician's notice, and the symptoms presented are not always local. The disease consists essentially of a slowly progressing inflammation of the vertebræ, only two or three being as a rule involved.

Symptoms.—These depend to some extent on the site of the disease. In many cases attention is first drawn to the spinal mischief by the child complaining of pain in the

thorax, or in the abdomen, or even in the lower limbs. Locomotion is always more or less affected, so that the patient has a stiff carriage. In many cases the formation of abscess is present, it may be retropharyngeal or under the psoas muscle. Deformity of the spine is not an early feature of the disease, and cannot therefore be relied on for diagnosis. When the disease has advanced, and more especially when it affects the cervical or upper dorsal regions, paraplegia may be induced. There is always more or less interference with the mobility of the spine which is apt to be painful on movement.

Prognosis.—If seen early these cases can often be successfully treated. Even when deformity has been produced good results may follow judicious treatment.

Treatment.—The remarks already made on the treatment of hip-joint disease apply here with equal force. Otherwise the treatment is to be conducted on ordinary principles.

The knee, ankle, elbow, wrist, and shoulder may be affected by tuberculous disease, but for particulars regarding these we must refer the reader to any good surgical treatise. *Tuberculous dactylitis* is also sometimes encountered, a condition which is apt to be mistaken for syphilis, or by a careless examiner for whitlow.

SYPHILITIC BONE DISEASES.

1. Osteochondritis or Acute Epiphysitis.

This is the condition specially associated with hereditary syphilis. The mischief occurs in the cartilage which intervenes between the bony shaft and the epiphysis.

Symptoms.—The disease usually presents itself during the first few weeks of life. As a rule it is met with in

the bones of the upper extremity, although it occasionally occurs in those of the lower limb. Tenderness, swelling at the epiphyseal junction, and abscess-formation are the chief symptoms, while separation of the epiphysis is very apt to take place.

Diagnosis.—This is usually easy, if a history of syphilis can readily be obtained. If not, we have to avoid mistaking the condition for infantile scorbutus.

Treatment.—The treatment is that of the general constitutional condition. Locally well-padded splints should be applied.

2. Dactylitis.

This is much less common in syphilitic than in tuberculous patients. The disease may affect one or more fingers or even the toes. Many authorities regard it as being altogether a rare disease, while others maintain that it occurs quite frequently. It has to be distinguished from tuberculous dactylitis.

3. Osteoperiostitis.

This is by far the most frequent form of bone disease manifested in the later stages of hereditary syphilis. The chief sites of bony change are the skull and the tibiæ. It is essentially a chronic disease in the course of which bony deformities arise, and abscesses form with the production of sinuses which show no evidence of healing.

Symptoms.—Prominences may be met with over the frontal bones, and may also occur on the shafts of the long bones, more especially of the tibiæ. There is always tenderness on pressure, and pain which is always aggravated at night. Necrosis occurs sooner or later,

abscesses are produced, and unhealthy sinuses then mark the presence of disease in the underlying bone.

Treatment.—The general treatment is that of syphilis. Surgical measures must be resorted to in order to remove sequestra and to promote the healing of chronic sinuses.

CHAPTER XII.

RHEUMATISM, AND THE RHEUMATIC AFFECTIONS OF CHILDHOOD.

RHEUMATISM in childhood differs very markedly from the similar disease as it is met with in the adult. It is, moreover, a disease which is probably much more prevalent during early life than has until recently been realised. Regarding the hereditary nature of rheumatism it is perhaps a little difficult to make any dogmatic statement. At the same time we constantly meet with cases in which we find one or both parents and other members of the family affected with this disease. Cases of this nature might be multiplied almost indefinitely, but we may mention one which illustrates very clearly the possible hereditary nature of rheumatism. The patient was a girl of fourteen years who complained of severe pains in the legs and back, and had a temperature of 101° Fahr. She had always been nervous, and on examination she was found to have enlarged tonsils as well as a dilated heart, with a mitral systolic murmur. Her mother suffered from arthritic pains, while her father was a martyr to rheumatism. She had seven brothers, three of whom had had attacks of acute rheumatism, while two others suffered from heart affection. Of her five sisters, two died of heart disease, while the three sisters living showed distinct rheumatic tendencies, one being constantly laid up with acute sore

throat, a second had had acute rheumatism three times, and the third had an attack of chorea in childhood.

The hereditary nature of rheumatism possibly implies more of a negative than a positive condition. The rheumatic child is, in all probability, one who has not inherited immunity to that disease; while the boy or girl who grows up to adult life without being attacked by rheumatism in one of its manifold forms is no doubt possessed of a blood which is antitoxic to the disease.

We now know that rheumatism is caused by a micro-organism, which in all probability possesses a definite life-history like that of malaria or of pneumonia. Moreover, we are inclined to believe that this organism flourishes best at a special atmospheric temperature, and under certain atmospheric and soil conditions which have not, however, up to the present been definitely determined. Popular belief teaches that dampness of soil and of the atmospheric air is highly productive of rheumatic affections. It is possible, however, that after all this has very little true relationship to a disease which is primarily caused by a specific micro-organism. The dampness of soil and air merely predispose the patient to an attack by lowering his health, or by favouring the growth of the disease germ. In fact, our observations up to the present time favour the belief that a dry soil is more productive of rheumatic conditions than one which is damp. It may be that the germ grows and develops more rapidly in a dry soil than it would in one which is moist; but it is carried upwards by air currents in the soil when the latter becomes damp, the organisms, being lighter than the moisture of the soil, tending to rise to the surface and so eventually to find their way out. These considerations, however, are for the present merely problematical, and there is still a wide

field open for research in connection with this most important subject.

Clinical Manifestations of Rheumatism.—In the adult acute rheumatism affords us the well-known symptom tripod of arthritis, sour-smelling sweat, and fever. In adults it is the first-mentioned of these symptoms which is most prominently marked, but in children this is not so. In the latter we have a more varied symptomatology, and one which is much less constant, and accordingly more readily overlooked by the physician. Strictly speaking, no single clinical picture can be given of rheumatism as it affects the child.

A fairly common experience is to have the child out of sorts for a day or two, with perhaps a slight sore throat. Eventually he becomes more distinctly feverish, and the medical attendant is called in. The axillary temperature is then found to be about 102·5° Fahr., sometimes above, but much more frequently below this level. The pharynx and tonsils may simply be found to be a little red and congested, or they may be more markedly swollen. The child, more especially if he is very young, will be irritable and cross, and in any case will be off his food. There may or may not be some tenderness or even pain, say in an ankle, a knee, or an elbow; but this is usually slight, and the throat symptoms are often far more marked at the outset than those in the joints. But the picture we have tried to draw is not completed here, for if we percuss lightly over the heart we can readily make out distinct increase in the cardiac dulness. If, moreover, we lay our hand over the præcordial region we notice that the impulse is more diffuse than normal, and is at the same time feeble. On auscultation, the first sound at the apex is fainter and less well defined, while at the base there is very distinct

accentuation of the pulmonary second sound. Now this is no description of a severe type of case; there is here presented one of moderate severity, the kind of case that is often carelessly enough treated with some antipyretic, and which is apparently cured, and, it may be, back to school or play within a week or so of our first visit. It is just such simple cases as the one we have tried to portray that cause so much suffering in after life, and as we shall see further on, there are other varieties of rheumatism in childhood which may quite as readily be mistaken as the one above described.

It is really in children after all that we should study rheumatism, if we are to understand clearly the nature of this disease. The arthritis, which is so prominent a feature in adult life, fades into insignificance when we are dealing with the child. There is, as it were, a great evolution process going on in the manifestations of this disease as we pass from childhood's years into the period of adolescence, and thence into adult age. As we shall presently see endocarditis and pericarditis are far more frequent in the rheumatism of childhood than in that of adults. Nearly 75 per cent of cases of rheumatism in childhood are associated with cardiac affections. We are far too apt, perhaps, to regard rheumatism and arthritic pain and swelling as synonymous terms. It is this fact that often leads us to neglect or to overlook the presence of rheumatism during childhood.

Differences between the Rheumatism of Adults and of Children.

Before considering more particularly the various manifestations of rheumatism in childhood, we may refer in passing to one or two very important points, not already

mentioned, in which acute rheumatism in the child differs from the adult disease. Thus the child rarely if ever exhibits profuse acid sweating so commonly seen in the adult. Hence also sudamina and miliaria are rare in childhood. Hyperpyrexia, again, which is a very important complication in adults, is rarely met with in children. There is probably, on the whole, less severe affection of the tonsils, when that is present, in the child than would be the case in older persons. There being less pain in the joints, it is very important to remember that in children suffering from rheumatism we not infrequently find great restlessness, which is of course never met with in the adult.

We are now in a position to consider more particularly the **various conditions which may be associated with an attack of acute rheumatism occurring during childhood.** There are indeed several important rheumatic manifestations, one or more of which may be met with in any particular case :—

1. Cardiac Manifestations.

(*a*) *Endocarditis* is a very common manifestation of rheumatism in children. Indeed we may almost say that it is probably the most common. There may or may not be associated with it stiffness and pain in one or more joints. This condition differs in some respects from that of adults. It is much less severe and acute, but at the same time it is less transient. It has a strong tendency to relapse and to recur, or to go dragging on for weeks, or it may be for months; in fact it tends to be subacute in its nature. With regard to the valves attacked, the mitral is the most frequently involved. Next in frequency comes the aortic, and less commonly

the tricuspid, while very seldom indeed do we find the pulmonary valve affected. Mitral stenosis is by far the most common result which is left after an attack of rheumatic endocarditis in children. This valvular affection is usually the result of a subacute, recurrent, and it may be comparatively slight, endocarditis.

On examining the heart in a case of rheumatic endocarditis we find as a rule a systolic murmur at the apex. Some little time later we may observe that the second sound at the apex is reduplicated, a sign which should suggest at once the probability that stenosis of the mitral orifice is taking place, the reduplication being the result of swelling and rigidity of the mitral cusps.

(*b*) *Pericarditis.* — This is another very important manifestation of rheumatism in childhood. We do occasionally meet with this condition in its acute general form, such as all are familiar with in the adult. In childhood, however, we usually find the subacute form present. It is so insidious in its onset as a rule, that it is often only by the closest daily observation of our patient that we are able to detect its commencement. The child becomes restless and more irritable, and may, if old enough, complain of pain over the heart. The pulse becomes more rapid, and the temperature is slightly elevated. On examination we may be able to detect just the faintest pericardial friction, which is often quite soft in character, suggestive perhaps of cardiac murmur rather than of friction. This sound may seem to disappear under treatment for a time, when one day we hear it again, or at least we notice that though the friction has entirely gone, still the pulse continues to be rapid and feeble, and the heart flutters perceptibly. On percussion, as time goes on, we observe that the cardiac dulness is increased, and the

heart sounds are somewhat indistinct. These physical signs are no doubt due to dilatation of the heart, with thickening of the pericardium over it. In many cases the child is apt to become more and more anæmic, and eventually becomes enfeebled and emaciated, until at last he may die from sheer exhaustion. Such a case may linger on for months; and the result is usually marked cardiac dilatation.

Pericarditis is frequently found to be associated with valvular disease. In fact, as was pointed out by Sturges in his Lumleian Lectures for 1894, pericarditis is invariably found post-mortem in the fatal heart disease of children. The chief fact, however, which characterises the pericarditis of children is its tendency to recur and to persist. It sometimes happens that in old-standing cases no friction is heard, and yet on post-mortem examination evidences of it are found. This is due to the formation of adhesions, which are almost certain to be formed after repeated attacks have occurred. Such cases as these, in which no friction sound can be made out, are not readily diagnosed, and we have to rely on the character of the pulse and the condition of the temperature, the latter being usually much less raised than we should expect from the rate of the pulse. An additional aid to diagnosis will be obtained if we find that the child is restless and irritable, with pain over the præcordium, vomiting it may be, and steadily becoming more and more pale, while at the same time his strength is diminishing.

(*c*) *Cardiac Dilatation.*—We have already seen how dilatation of the heart occurs in children who are the subjects of rheumatic pericarditis, and this dilatation comes on quite rapidly; but there is a form of dilatation which occurs in acute rheumatism, in cases where there is no

evidence whatever of pericarditis. In fact cardiac dilatation may be said to be present in practically every case of true rheumatism as it is met with in early life. The reason why it is so often missed is because auscultation of the heart in rheumatic cases is too much relied on for obtaining information as to the condition of this organ. If percussion were used more frequently then cardiac dilatation would almost certainly be found to be present in the greater number of cases. Even when auscultation alone is relied upon, although no murmur may be detected, still if the first sound is feeble and somewhat obscured, then we should suspect enlargement of the heart.

Fisher has pointed out that when a systolic mitral murmur is present during an acute attack of rheumatism it is rarely the result of endocarditis, but is more commonly due to ventricular dilatation. The enlargement of the heart, which is of course most definitely ascertained by percussion, may be both to the right and to the left, and even upwards. In children it is so comparatively easy to percuss out the cardiac dulness that there is no excuse for neglecting this part of the physical examination. The presence of dilatation is no doubt explained by the fact that the rheumatic toxin specially singles out the cardiac muscle for its attack in the same way as the toxin of diphtheria does. This dilatation is also met with in many cases of chorea, which is one more point in favour of the argument that chorea and rheumatism are closely related.

When acute dilatation of the heart occurs during the course of rheumatic pericarditis, we have the pulse becoming very rapid and feeble, vomiting is apt to supervene, and the patient very frequently dies from sudden cardiac failure. When, however, dilatation occurs apart from pericarditis the patient usually recovers, and the

heart gradually returns to its normal dimensions, provided there has been no endocardial change.

2. **Subcutaneous Tendinous Nodules.**—Although these are occasionally met with in the adult, it is in the rheumatism of childhood they are most frequently encountered. In children they are not generally painful, or at least not markedly so, whereas in the adult they are apt to be exquisitely tender. They are met with in the form of small prominences about the elbows, knees, back of the head, and along the spinal column. It has been said that cases in which they are found are specially serious, and that as a rule cardiac complications are generally present as well. This statement, however, is perhaps somewhat overdrawn, as we have on several occasions met with rheumatic nodules where the patient was not very seriously affected, and made a rapid and good recovery.

It is well, perhaps, also to remember that nodules of a very similar nature have been met with in cases in which there was absolutely no rheumatic history to be obtained. Although, accordingly, too much stress should not be laid upon the finding of these nodules in rheumatic cases, still it is advisable that they should be looked for on every possible occasion.

3. **Cutaneous Affections.**—Rheumatism in children is apt to give rise to quite a number of cutaneous lesions; the most characteristic being an erythema, which presents somewhat varied types in different cases. The variety known as erythema nodosum is occasionally met with in children, and no doubt in some cases this is a genuine rheumatic manifestation. The condition known as purpura rheumatica has been already referred to (*vide* p. 212). In this condition we find a purpuric eruption in associa-

tion with swellings of certain joints, as well as epistaxis and, it may be, other forms of hæmorrhage.

Psoriasis and rheumatism are undoubtedly related, although this is denied by many authorities. Our own personal observations seem to prove that during childhood psoriasis is usually met with in those of a rheumatic diathesis. One of our most marked cases of this skin affection was that of a little girl, who had been under our care on different occasions with attacks of acute rheumatism, chorea, pericarditis, and purpura. The family in this case were all rheumatic, not one having escaped, at some time or other, the manifold affections which rheumatism produces. Often, on questioning the parents, we elicit the fact that one or other of them is rheumatic, or we may even obtain a parental history of psoriasis.

4. Affections of the Throat.—Pharyngitis and tonsillitis deserve to be more frequently regarded as rheumatic than they are at present. Not uncommonly an attack of acute rheumatism in children is ushered in by sore throat. Indeed it has been suggested that the tonsils are the medium through which the micro-organism of rheumatism finds an entrance to the body, and that the toxins pass into the circulation from the throat as the primary seat of infection. There is much to be said in favour of this theory, and at all events there are many cases of tonsillitis in childhood associated with malaise and general aching all over the body, which, if not in reality rheumatic in origin, are quite as important, from the point of view of treatment and of after results, as an actual arthritic attack. It becomes, however, a matter of difficulty when we have a child with acute sore throat to say whether or not the condition is really a rheumatic manifestation. It may not be always easy to determine which attacks of

tonsillitis and sore throat are to be termed simple and which rheumatic; but until we are absolutely certain such cases should always be treated on the latter assumption.

5. Pulmonary Conditions.—Pleurisy, occurring during the years of childhood, is often rheumatic in origin. It may be also, as in a case which was recently under our care, that pneumonia may occasionally be caused by the specific organism of rheumatism. Certainly in the case referred to, that of a child of six years, the family history was strongly rheumatic, and after the pulmonary condition had cleared up, the child showed unmistakable evidence of chorea.

6. Appendicitis.—Appendicitis is undoubtedly a rheumatic affection in not a few cases. It is a fairly common disease in childhood, although its diagnosis is apt to be missed in the case of young children. Sometimes a child is brought to us complaining of abdominal pain, which passes off under simple treatment, only to recur in a few weeks. It is a safe rule to regard these recurrent attacks, especially if they are associated with sickness, as appendical in origin, and to be prepared to find that one of them will eventually prove to be an unmistakable attack of inflammatory mischief in this region. Such at least has been our experience. Apart altogether from this type of case, we have others in which the evidences of the disease are clear from the outset, and in some of these also we have been able to make out a distinct history of rheumatism. We fear that the inter-relation of rheumatism and appendicitis is apt to be lost sight of, but the association is such an important one that it deserves to be accorded every attention.

There is an abnormal condition, to which we have

ventured to give the name of *Gastro-intestinal Spasm*, in which the child complains of acute gastric pain after a meal and has a sudden call to stool. These cases are certainly not all of rheumatic origin, but many of them undoubtedly are. At all events we have found them frequently relieved under anti-rheumatic treatment when all other remedies had failed.

7. Anæmia and Debility.—Almost invariably we find *Anæmia* to be one of the many sequelæ of an attack of rheumatism in childhood. In rheumatic anæmia the red blood corpuscles are greatly diminished, while the leucocytes are increased. The hæmoglobin also shows reduction in its amount. This condition of the blood readily explains the pallor of the child, which is often quite extreme.

Debility, which is a term frequently employed when no other name can be given to the condition of the patient, is not uncommonly found to be the only manifestation of rheumatism present. In such cases the child may complain of pain in the side, or in the upper part of the chest, or it may be in the lower limbs (so-called growing pains). This pain is sometimes not very acute, and is often most marked when the child is tired out after play. Of course many of these cases are due to gastro-intestinal disturbance, or to other causes; but a certain proportion of them are of rheumatic origin, and must be treated accordingly.

Lastly, we would point out that children of a rheumatic inheritance do not always present any definite manifestation of the disease. They are often, however, found to be extremely nervous and irritable, extremely sensitive, thin and spare, subject to fits of violent temper, and are generally of a restless disposition, constantly on the move,

and ever on the outlook for some fresh form of amusement. As we shall again point out, it is when this nervous restlessness reaches a certain maximum that it becomes associated with muscular movement which progresses steadily, until we eventually find the condition of chorea established.

Diagnosis.—The diagnosis of rheumatism in childhood is often a matter of but little difficulty if we remember the various manifestations which may present themselves. At the same time we must not forget that there are cases in which there is considerable difficulty in determining whether or not the symptomatology, or it may be the condition of the heart, is the result of rheumatism or not. Whenever difficulties of this kind arise the case should be treated as if it were rheumatic until time and the effect of anti-rheumatic remedies indicate to us the real nature of the disease.

Prognosis.—The prognosis of rheumatism in childhood is not altogether very hopeful, in view of the fact that the heart is so frequently singled out as the organ for special attack. Apart from this, however, rheumatic children frequently grow up to adult life, although they rarely if ever altogether lose their tendency to rheumatic affections.

Treatment.—Prophylaxis plays a very important part in the management of children whose parents are rheumatic. Such children must be, at all times, warmly clad, and especially so during the autumn and early winter months. They must never be allowed to remain in damp clothes, and schools and living apartments should be so ventilated that no draughts are occasioned to the occupants.

If the child has a sore throat this should not be

neglected, but treated carefully lest a greater evil develop. Whenever the child complains of pains in the limbs, and seems feverish, he should be put to bed between blankets and carefully treated.

If, however, in spite of prophylactic measures, an attack of rheumatism develops, then the child should have a hot mustard bath, followed by rapid and thorough drying with a rough bath towel. He must then be immediately placed in bed between blankets, and a warm drink given.

With regard to drugs, there are two which are of most value, namely, aspirin and calomel; the former entirely replaces salicylate of soda in the treatment of the rheumatism of childhood, as it is much more easily taken, and besides is not nearly so liable to cause nausea and vomiting. To be of any service, however, aspirin must be given in comparatively large doses. To a child of five years, $7\frac{1}{2}$ grs. may be given every four hours for several days. We have heard it stated more than once that children do not tolerate the salicylates well. Our experience, however, has been quite the reverse. An occasional dose of calomel will be found of service, not only in removing toxins from the blood, but also in beneficially affecting the heart. This organ should be carefully examined in every case, not only by auscultation, but by percussion as well.

There is always a tendency to allow rheumatic children out of bed far too soon. Three weeks should be the very shortest limit, and it is usually advisable to keep them at rest for a much longer period, in view of the fact that the heart is almost certain to be affected.

As to the after treatment, tonics are advisable, and warm clothing is imperative. All nervous and bodily strains are to be avoided, as tending to injure the

circulatory and nervous systems. Above all things, school pressure must not be allowed, and in those cases where the rheumatic attack has left some heart affection behind still greater care must be exercised in the after treatment of the case.

Cod-liver oil emulsion and virol are usually taken with advantage by rheumatic children, either during convalescence, or throughout the colder seasons of the year. Lastly, it should be remembered that when once a child has been attacked by one of the various forms of rheumatism, any illness which he may subsequently have, no matter how trivial this may be, should be regarded as rheumatic until evidence to the contrary has been obtained.

CHAPTER XIII.

SYPHILITIC AFFECTIONS OF CHILDHOOD.

Syphilis may manifest itself either at or soon after birth, while in some instances its presence may not be revealed until a later period in the child's life. In this chapter we shall consider somewhat briefly the various manifestations of this disease under two headings: (1) early, and (2) late.

1. Early Manifestations.

The infant at birth may be perfectly normal in appearance, and well developed; or it may be undersized, while the skin shows a distinct rash. In either case the infant soon ceases to thrive, and if no cutaneous eruption has hitherto made its appearance it is now, as a rule, presented to us in the form of *macules* or *papules*. The early rashes are multiform in character, varying between an erythema on the one hand and a bullous eruption on the other. As regards the site of the eruption, it is often widespread, although it frequently shows a distinct predilection for the face, lower part of the back, the buttocks, and the thighs. The erythematous form of rash often becomes very extensive, covering large areas of the body, and every now and then a fine desquamation may be observed. The

palms of the hands and the soles of the feet are usually found to be very red and covered over with a few fine scales.

When papules appear they are usually extremely small, and never very numerous. They likewise show a tendency to be covered over with fine scales. A bullous eruption, commonly known as pemphigus, is sometimes met with upon the palms and soles, and in bad cases upon other parts of the body, more especially upon the arms and legs. These bullæ frequently become very much enlarged, and their presence always indicates a severe form of the disease.

Next in frequency to these cutaneous manifestations we have a form of *nasal catarrh*; indeed this may be the only manifestation of syphilis present. In consequence of the discharge from the nose the infant is observed to snuffle. The secretion is of a purulent character and is very persistent. It is this latter characteristic which distinguishes it from the common form of simple coryza, which is so frequently met with in young infants. On account of the difficulty of breathing the nursing of the infant may become almost or even entirely impossible; and sooner or later the delicate framework of the nose becomes destroyed, causing depression of the bridge.

Fissuring is sometimes seen about the angles of the mouth, but it may also occur in other parts; while *mucous patches* may be found in the area behind the ears, about the arms, and in other situations. These patches are always moist, and have a reddish or greyish white appearance.

Amongst the other early evidences of syphilis, the *cry* of the infant forms one of the marked characteristics of this disease. The cry is hoarse and exceedingly faint,

so that in many cases no sound whatever is emitted. *Marasmus*, sooner or later, almost certainly manifests itself. It is not always, however, very pronounced; but its presence should always be looked upon with suspicion, especially when under careful and regular feeding the infant fails to improve, although neither vomiting nor diarrhœa is present to account for this. The marasmic condition may be so extreme that the infant seems to consist of little more than a skeleton covered over by a skin, which hangs in loose folds upon the bony framework beneath.

The *nails* are frequently characteristic, and are often found to be somewhat narrowed and compressed, with distinct furrows on them.

The condition of the *spleen* is one of enlargement. Not only is it enlarged, but its consistency is distinctly firm, and the organ may easily be palpated for an inch or more below the edge of the ribs. In many cases the *liver* shows considerable enlargement as well. Absence of splenic enlargement, however, must not be taken as an indication that syphilis is not present. It is only in those cases in which the organ can readily be palpated, and in which other unmistakable evidences of the disease are present as well, that this physical sign is of any real value.

Acute epiphysitis is the most frequent form of bone disease observed in the infantile form of syphilis. This may lead to separation of the epiphyses, to a suppurative arthritis, and even to osteomyelitis. As a rule this condition comes on very acutely, and is most frequently seen before the sixth month, while in the majority of cases it makes its presence felt at any period after birth until the third month. As a rule, attention is directed to the condition by the inability of the infant to move the limb, and

these cases are not infrequently erroneously diagnosed as truly paralytic. There is often considerable pain on attempting to move the affected limb, while on pressure this is still more apparent. A certain amount of swelling is generally present, and this may be partly due to synovitis of the joint, and partly also to inflammation of the bony structures forming the joint. This epiphysitis may affect more than one joint, and the fluid present in some cases is found to be purulent. The elbow is the joint most frequently attacked, but the knee, or indeed any of the other joints, may be affected. In some cases, in addition to the synovitis, we have also a certain amount of thickening of the periosteum covering the adjacent bones, and indeed syphilitic nodes have occasionally been found present, more especially on the bones of the lower limbs.

A few cases are met with in which the bones of the fingers are found to be diseased. The affected finger becomes enlarged in a somewhat cylindrical fashion, and this enlargement is as a rule painless.

Choroiditis and *iritis* are the two most frequent ocular manifestations of syphilis in infants. When present they are usually found during the first year of life. Iritis is, however, in our experience, very much less frequent than choroiditis.

The other early lesions we may simply mention in passing. In some instances the infant at birth is found to have an unduly large amount of hair upon the scalp. In other cases the hair is peculiarly scanty, and shows a tendency to fall out, more especially perhaps over the eyebrows, while the eyelashes become greatly thinned.

Craniotabes may or may not be present; and, in our opinion, this condition is certainly not of itself to be regarded as a manifestation of syphilis. Cervical adenitis,

more especially affecting the glands in the posterior triangle, is sometimes present. Anæmia is often very well marked. Testicular enlargement may be met with, and should always be looked upon with considerable suspicion when the history is otherwise obscure.

2. Late Manifestations.

Under this heading we shall now pass on to consider the manifestations of syphilis as they are seen about the period of puberty. It must, however, be remembered that between the periods at which the early and late manifestations of the disease are observed there is no hard and fast dividing line.

These later evidences may be present without our being able to obtain a previous history of the disease during infancy. This is a point which is sometimes forgotten; and symptoms, which would otherwise be regarded as syphilitic in origin, are accordingly set down as being due to some other cause altogether.

It is not by any means an easy matter to state which is the commonest of all the later manifestations of syphilis in children. The child may be perfectly well developed, and absolutely normal in all respects, save for the presence of one pathological condition only. *Interstitial keratitis* is not uncommonly met with. It is usually symmetrical, and is perhaps most commonly limited to a slight opacity of the cornea. Next to this we would place the characteristic appearance presented by the permanent *teeth*. The upper central incisors are the ones to which attention must be directed. They are notched, and the enamel in the centre of this notch is often defective. These teeth are also somewhat peg-shaped and irregular.

Deafness is sometimes met with, and in such cases it is probably of nerve origin, induced no doubt by a chronic inflammatory condition of the bony structures of the internal auditory meatus and labyrinth.

Ulceration of the nose and of the hard and soft palates is sometimes present; and this ulceration may lead eventually to perforation of the structures named.

The most common affection of the bones is a form of *chronic periostitis*, which shows a tendency to develop into an osteitis as well. This condition chiefly affects the shafts of the long bones, although it may also involve those of the cranium. The tibia is the bone most frequently involved. The shaft is more or less thickened and enlarged, and the disease runs a very chronic course. It is associated with more or less deformity, and with a considerable amount of localised pain and tenderness. The characteristic feature of the pain is that it tends to be markedly increased during the night. In other cases we have a chronic form of *synovitis* which is usually, as distinguished from the last-mentioned affection, unaccompanied by pain. It most commonly affects the elbows and knees, and may spread from one joint to another. The facts that there are no tenderness about the joint and no pain, serve to distinguish this condition from tuberculosis or rheumatic affection.

Glandular enlargements are sometimes met with, although they are not of themselves diagnostic. *Gummata* which, if neglected, are apt to produce well-marked ulcers, may be met with about the lower part of the body, and these gummata, when present, are always characterised by their hardness and their greyish white appearance.

A chronic form of *laryngitis* is sometimes met with in children who are the subjects of syphilis; while *bronchitis*,

of a more or less chronic type, is occasionally encountered. The liver and spleen may be greatly enlarged, while affections of the nervous system, as well as certain forms of mental disease, may be found as the result of inherited syphilis.

Diagnosis.—The diagnosis of this disease during the period of infancy may be easy or difficult, according to the presence or absence of definite symptoms. Chronic nasal catarrh in an infant should always be regarded with suspicion, especially if associated with any form of skin eruption. Marasmus, which fails to improve under careful and regular feeding, and which is not associated with vomiting or with diarrhœa, is almost certain to be syphilitic in its origin. Too much reliance should not be placed upon enlargement of the spleen, nor upon the absence of a definite history of heredity. After the period of infancy, and especially in later childhood, the presence of interstitial keratitis, associated with depression of the bridge of the nose, and one or more of the other later manifestations already described, form the best guides to diagnosis.

Prognosis.—During the period of infancy this is not always very hopeful. Still under careful treatment much may be done to modify the severity of the lesions, and to aid the patient in overcoming the virulence of this disease.

When the first symptoms make their appearance during childhood the prognosis is much better; and if the child is placed promptly under treatment recovery is more or less certain.

Treatment.—This should be commenced as soon as the condition has been diagnosed or suspected. During the first six months of life inunctions may be employed, and for this purpose the following ointment will be found very suitable:—

℞ Ung. Hydrarg.
Lanolini . . . . . āā ʒii.

Fiat Ung.

Sig.—A small piece to be used daily as directed.

This ointment may be rubbed into the abdomen, axillæ, or the popliteal space every morning, the area of inunction being varied from time to time. Otherwise hydrarg. cum cret. may be given in doses of a half to one grain three times a day. It has been stated that large doses of mercury administered to infants are very apt to lead to a sudden fatal termination of the case; and while this fact should perhaps be kept in view, too much importance should not be attached to it. When this powder tends to produce diarrhœa, it is well to add to it one or two grains of bismuth. The later manifestations are to be treated in the same way, with usually the addition of pot. iod. or of iodipin. In older children this may sometimes be advantageously combined with liq. hydrarg. perchlor. In administering the latter preparation too small doses should not be given. In fact, to obtain good results not less than one or two drachms should be given to a child of ten years.

Nasal catarrh may be dealt with by gentle warm boracic douching, and the application of a weak mercurial ointment to the interior of the nostrils. Cutaneous lesions may be treated either with lotio nigra, or with dilute mercurial ointments.

Regarding the actual treatment of the disease, it is important that mercury in one form or another should be administered for some time after all evidence of the symptoms has disappeared. In addition tonic treatment will usually be found necessary, while the feeding and general hygiene of the patient must not be neglected.

CHAPTER XIV.

DISEASES OF THE NERVOUS SYSTEM.

Note as to the Method of Examining Children Suffering from Nervous Disease.

In addition to inquiring into the family history of the patient, and obtaining particulars as to the condition of the other systems, a special series of inquiries must be conducted in order to obtain definite information regarding the special disease from which the child is suffering. The shape of the head must be noted, and any abnormality in size recorded. The condition of the fontanelles, and especially the presence of bulging or depression of the anterior one, demands attention. Passing from the head and coming to the face, any evidence of paralysis should be noted. The facial expression of the patient is often helpful, more especially in determining any condition of amentia or idiocy. The condition of the palatal arch should be examined in every case, as in certain affections this is apt to be unduly high. With regard to the trunk very little information can be obtained in the child beyond the observation of any respiratory abnormality and the condition of the various reflexes.

Passing to the extremities, we note the presence of any atrophy or hypertrophy of the various muscle groups.

We note, also, if the different movements at the various joints can be performed normally or not. The state of the reflexes require to be carefully observed, and the presence of any muscular contractures noted. The grasp of the child and his gait should next be considered. If the child is unable to walk then the power of standing should be recorded.

Having conducted the examination so far, we next proceed to inquire as to any abnormal sensations, such as pain, paræsthesia, or anæsthesia. In children, however, sensory symptoms are not of so much importance as in adults, and it is not an easy matter to definitely locate painful spots in children, as they so frequently misinterpret the position of their sensations.

The special senses require to be investigated, more especially sight and hearing. The power of speech is of much importance in the investigation of nervous disease in children. The mental condition has also to be thoroughly inquired into.

Electrical reactions are, for obvious reasons, very difficult to employ as a means of diagnosis in young children; still this method is often of the greatest service in arriving at a differential diagnosis in difficult cases.

DISEASES OF THE BRAIN AND ITS MEMBRANES.

MENINGITIS.

Inflammation of the membranes of the brain may involve either the dura or pia mater, but in the majority of cases it is the latter which is more particularly affected. We shall, therefore, confine our attention to a consideration of leptomeningitis, as it is termed. This may occur

either in the simple acute form, or as a tuberculous affection.

A. Simple Acute Meningitis.

Etiology.—Setting aside the epidemic cerebro-spinal form, we find this disease following on pneumonia, influenza, and certain of the other infectious diseases, of which scarlatina is perhaps the most important. It may also occur as a sequel to middle ear disease, and it may be met with as a complication of various cerebral conditions, such as abscess. Injury to the head may produce it in some cases, and it has been met with in association with acute renal disease. Sometimes no definite cause can be assigned, and these cases, no doubt, are most frequently the result of pathogenic organisms which have gained an entrance by some undiscoverable channel. A chronic form, chiefly affecting the base of the brain, is occasionally found in infants, and this is very often due to syphilitic infection, though in some instances it is very difficult to determine how this condition has originated.

Symptoms.—The disease usually comes on quite abruptly with vomiting and headache, and sometimes convulsions are present as well. In many cases vertigo forms a very prominent symptom. The pain in the head is very severe, and sooner or later it extends to the back of the neck and spinal column. The vomiting occurs quite independently of food, and is generally of the true cerebral type. The pulse and respirations are rapid. The pupils are usually contracted. In a few hours, or it may be days, the symptoms become markedly aggravated. The pulse now tends to become irregular, while the pupils are distinctly dilated. The head is retracted, and the muscles of the face and extremities give evidence of

twitchings, and it may be, convulsive movements. Delirium is apt to supervene, and eventually the child may become quite comatose and develop Cheyne-Stokes breathing. In bad cases the abdomen may be found to be considerably retracted. Obstinate constipation is usually a marked feature of this disease.

In chronic basal cases opisthotonos is usually well marked, while there is always a certain degree of hydrocephalus present.

In many cases of simple acute meningitis we may find a paralysis involving either one or more limbs, while ocular paralysis leading to ptosis, strabismus, and diplopia may occur. Optic neuritis is fairly common, and gives rise to more or less blindness.

Diagnosis.—The differential diagnosis of simple acute meningitis is not always an easy matter. Head symptoms are not uncommon in many of the fevers, while in pneumonia they may also be developed. In the early years of life convulsions frequently usher in attacks of infectious disease, which are thus readily mistaken for meningitis. In some cases middle ear disease has been erroneously diagnosed as meningitis on account of the pain, vomiting, and the high temperature which may be present. The chief points on which we must rely for a diagnosis are the headache, causeless vomiting, irregularity of the pulse, and alterations in the pupils.

As the disease most often mistaken for meningitis is pneumonia, the following table may be found helpful, as it gives the chief points which are to be relied upon in making a differential diagnosis.

[TABLE

	PNEUMONIA.	MENINGITIS.
Respirations.	Rapid throughout.	Rapid at first, but soon become slow and irregular.
Pulse.	Rapid throughout.	Rapid at first, but becomes slow and irregular.
Physical Signs.	Always present as the disease advances.	Absent.
Nervous Symptoms.	Less marked, and less persistent.	More marked, and tend to increase.

Prognosis.—This disease is very unfavourable as regards the ultimate result. Recovery, however, does occur, though the after results are apt to be somewhat serious. The eyesight may be affected. Mental conditions not infrequently supervene, while a certain degree of paralysis may remain as a result of the disease.

Treatment.—Under the head of treatment very little can be said, as it is difficult to control a disease such as this by any definite therapeutic measures. Provided the child is not too much depressed, ice may be applied to the head; but in many cases this makes the child more fretful and irritable, and it may then be replaced by the use of linen wrung out of acidulated water. Large doses of bromides and iodides are usually indicated, and these certainly aid in soothing the nervous irritability, while at the same time they tend to reduce the inflammatory condition. As a rule stimulants become necessary, and the best is pale brandy well diluted. Feeding often presents insuperable difficulties, and the nasal tube may be required in bad cases. The bladder and bowels should be carefully attended to in all cases, and calomel purges administered from time to time.

The sick-room should be kept well ventilated and as free from noise as possible. To counteract the coma which is apt to supervene, hot baths are often of considerable service. Inunctions of the head with mercurial ointment seem to be of benefit in certain cases, and may certainly be given a trial when other measures fail. During convalescence tonics such as malt and cod-liver oil will be required; otherwise the after treatment will depend on the condition of the patient as regards paralysis, deafness, or any other sequela which may remain.

B. Tuberculous Meningitis.

This is the most common form of meningitis in children. It is a serious disease, and one from which recovery probably never takes place.

Etiology.—It is seldom seen before the age of six months, but it is extremely common after this all through infancy and early childhood. In the majority of cases a family history of tubercle can be obtained, but in some instances no such hereditary tendency can be made out. Tuberculous meningitis may form the last link in the chain of general tuberculosis, but in the larger proportion of cases the patients have had no pre-existing tuberculous manifestation whatever. Gastro-intestinal disease, adenitis, and pneumonia may have been present; but apparently this disease attacks robust, healthy children, as well as those whose constitutions have been weakened by disease.

Symptoms.—The division of the symptoms into three periods which is sometimes made is very arbitrary, and in many respects quite fallacious. The symptoms vary considerably when the disease occurs in infants from those which are observed when children are affected. Tuberculous meningitis in infancy runs a very rapid course.

The patient becomes greatly emaciated, the temperature tends to rise, while ocular and general paralyses are very commonly met with.

In children the disease presents quite a different picture. The first thing that may be noticed is perhaps a little gastric catarrh. Constipation is very frequently complained of, and the child ceases to take an interest in his toys. He becomes languid and drowsy, complains of feeling tired, and does not seem to care to exert himself.

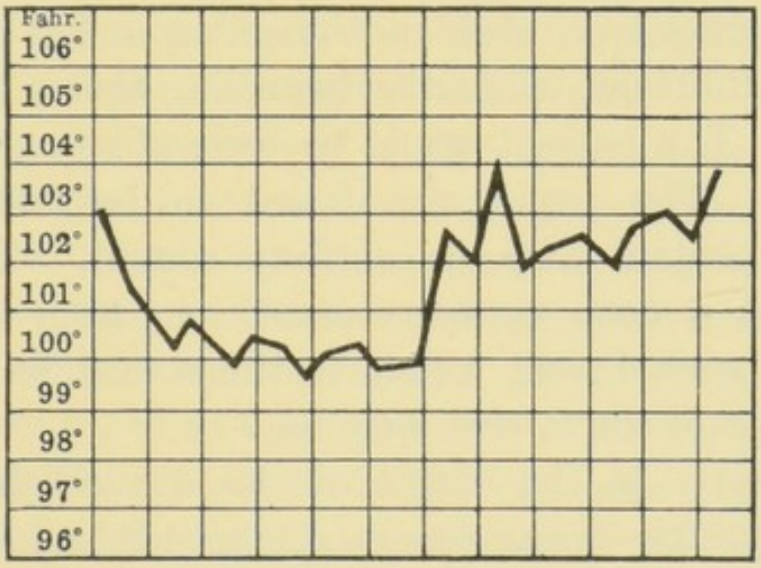


FIG. 8.—Temperature Chart in a case of Tuberculous Meningitis which resulted in death.

Sooner or later he goes off his food, and attacks of vomiting set in. The temperature now begins to rise, but at first it may not be at all characteristic. The child now takes to bed, and the symptoms become more pronounced. The vomiting continues, the temperature tends to rise, and may in some cases register 105° Fahr. The pulse is rapid, and the breathing tends to be somewhat increased in frequency. The child is constantly found to complain of pain in the head. The drowsiness continues to increase. He may complain also of pain in the epigastrium or in

the abdomen generally, which may be somewhat depressed. Presently twitchings and convulsions set in, while evidence of ocular paralysis becomes more or less marked, the pupils becoming dilated and reacting very sluggishly to light. The head becomes retracted, and the pulse is slow and irregular. Cheyne-Stokes breathing may be developed. At this period the child will often utter a sound which is known as the hydrocephalic cry.

When this stage is reached the patient usually goes from bad to worse. The temperature rises, while the pulse continues to be slow and irregular, and it may be at times intermittent, while the breathing also is apt to be irregular. The patient tends to become more definitely paralysed. The pupils are found to be dilated, and sphincter control may be entirely absent. The child passes into a deep comatose condition, from which he cannot be roused, and which at times may be modified by the onset of convulsive seizures.

Diagnosis.—At the outset of the disease the prominence of gastric symptoms is apt to mislead even the most careful observer. It is not, as a rule, until the disease has advanced that we are able to differentiate it from conditions presenting somewhat similar symptoms. It may be mistaken for typhoid. In the latter disease vomiting is not uncommon, but in tuberculous meningitis there is no enlargement of the spleen, and no retraction, but rather distension, of the abdomen; while the slowing of the pulse and the irregularity of the respirations are much more characteristic of a meningeal condition than of typhoid fever. Again, Widal's reaction cannot be obtained in meningitis, and this alone is of great value in enabling the physician to arrive at a definite conclusion as to the nature of the disease.

Tuberculous meningitis may also be mistaken for pneumonia, as the nervous symptoms which are met with in the latter disease cannot readily be distinguished from those which we find in tuberculous meningitis. As a rule, however, the evidence of respiratory disturbance is much greater in pneumonia than in meningeal affection.

From simple acute meningitis the tuberculous form is not always readily distinguishable. The presence of tubercles in the choroid is said to be diagnostic, but as these are very frequently absent no great reliance can be placed upon this phenomenon. More important is the fact that in simple meningitis the period of onset is comparatively short, whereas in the tuberculous variety the prodromal symptoms may continue it may be for two or three weeks. Again, in the tuberculous form the pulse and respiration tend to be slow and irregular, whereas in simple meningitis they are usually found to be rapid. Lumbar puncture, when employed, will show the presence of tubercle bacilli in the fluid in the one case, whereas in the other certain other micro-organisms will be found.

Prognosis.—It is probably correct to say that no case of tuberculous meningitis ever recovers. It is true that instances have been recorded throughout the literature in which the patients are said to have had all the evidences of a tuberculous infection, and yet have eventually got better. Such cases, however, must be regarded as errors in diagnosis. The prognosis, therefore, is practically hopeless, though many cases are found to linger on for several weeks. A very striking feature which is observed in connection with this disease is that the child will often be thought by the physician to have only a few hours to live, and yet death will not take place for many days, the patient lying the while in a comatose condition.

Treatment.—All these cases are practically hopeless. It is well, however, in order to satisfy the parents and friends, that we should employ every available measure with a view to ameliorating the sufferings of the patient. At the outset a calomel purge should be administered. Large doses of bromide and iodide should be given, and mercurial ointment applied over the scalp, which has been previously shaved. In no case should ice be applied to the head, but it may be placed over the nape of the neck if the patient will tolerate it. As a rule, however, the use of ice in any form tends to make the child more restless, and its application therefore has generally to be discontinued. In this, as in simple meningitis, feeding usually presents great difficulty, especially in the later stages of the disease. We do not, in such cases, advise the use of the nasal tube, or even of nutrient enemata, as these only cause the sufferer additional distress; and we therefore consider that if the child refuses food, or becomes comatose, it is much better to leave him alone.

TUMOURS OF THE BRAIN AND ITS MEMBRANES.

Tumours of the brain are comparatively frequent in children, the most commonly met with being a tuberculous formation. Next in order come gliomata, sarcomata, and cysts. These are more commonly found in the cerebellum than in any other part of the brain.

Etiology.—Regarding the etiology of tumours of the brain very little definite is known. In some cases, however, injury seems to have formed the starting point for the neoplasm, but in many instances there can be no doubt that this is more a coincidence than the actual cause of the tumour.

Symptoms.—Headache, vomiting, optic neuritis, and convulsions form a fairly typical symptom group. The pain in the head is usually pretty intense, and generally results in more or less insomnia. The vomiting has no relation whatever to food, and comes on quite suddenly and unexpectedly. Double optic neuritis is, of course, only evident on ophthalmoscopic examination, while convulsions are not of themselves distinctive; when, however, the latter are associated with headache and causeless vomiting, the possibility of a cerebral tumour being present should always be thought of. In addition to the symptoms already referred to, vertigo, which is often very pronounced, may be mentioned.

The localising symptoms of cerebral tumour will depend entirely upon its position. The cerebellum being most frequently affected, vertigo is often a leading phenomenon in connection with neoplasms of the brain. In such cases certain of the cranial nerves may be pressed upon, and produce resulting symptoms, such as ocular and facial paralysis, as well as deafness.

Tumours of the pons may produce hemiplegia, while facial paralysis and deafness with involvement of certain of the eye muscles may be present as well. Pressure upon other parts of the brain will produce characteristic evidences, especially if the motor areas of the cortex be involved.

In all cases more or less rapid emaciation will be present as the condition advances.

Diagnosis.—The diagnosis between meningitis and tumour of the brain is rarely a matter of much difficulty, as in the former the symptoms develop with much greater rapidity than in the latter, though occasionally tumour of the brain follows a fairly rapid course. It

is much more difficult to distinguish between cerebral tumour and cerebral abscess.

In abscess of the brain a history of middle ear disease can usually be obtained, while the presence of temperature and the somewhat insidious development of the symptoms point rather to abscess than to solid tumour.

Prognosis.—This is not at all hopeful. As most of the tumours of the brain occurring in childhood are of a tuberculous nature, little hope can be entertained of recovery. Moreover the other forms of tumour met with are not such as can readily be removed.

Regarding purely medical treatment, large doses of iodide often prove beneficial in alleviating the intracranial pressure, and thus ameliorating to a certain extent the awful headaches from which these patients suffer. Inunctions of mercury are sometimes found to be of use, while chloral hydrate with bromides may be necessary when convulsive seizures form a prominent feature in the case. Lumbar puncture is probably of comparatively little service, and may indeed do more harm than good in these cases. Finally, we would say that operation should never be resorted to save as a last chance, not only because these tumours are often tuberculous in character, but also because operations on the brain in young children are apt to be attended by such an amount of shock that the patient cannot possibly be expected to recover.

ABSCESS OF THE BRAIN.

Cerebral abscess is not a common disease in childhood. Still, probably one-fourth of all the cases met with occur during the early years of life.

Etiology.—The outstanding cause of abscess of the brain is undoubtedly middle ear disease. It may, however, occur in connection with injury to the cranium; while other cases, again, are met with as a sequel to nasal trouble. The abscess may be met with in almost any part of the brain, while a multiple condition is sometimes found to be present.

Symptoms.—Unfortunately the symptoms of cerebral abscess are not at all definite. It is apt to develop somewhat slowly and insidiously, and is often in existence for several months before any definite signs of its presence can be recognised. It should always, however, be suspected when we find that a child who is suffering from middle ear disease shows a definite rise of temperature, together with headache, vomiting, giddiness, and apathy. There is often also a certain amount of tenderness, which can be made out by percussing the head. Convulsions and even paralysis may be present, but these, of course, are not of themselves sufficiently typical. In a great many cases no symptoms whatever are present, and the child becomes emaciated, sinking into a collapsed condition, and eventually dies without a diagnosis having been made.

Diagnosis.—The differential diagnosis of abscess from tumour of the brain is not always an easy matter. The presence of temperature and the somewhat sudden development of symptoms are characteristic of abscess rather than of tumour. Meningitis may readily be mistaken for abscess of the brain, but as a rule meningitis develops with much greater rapidity a definite train of symptoms than does cerebral abscess.

Prognosis.—Although abscess of the brain may exist for months, or even years, the ultimate prognosis is undoubtedly bad. Operation holds out the only chance

of recovery, but in young children surgical interference does not as a rule prove beneficial.

Treatment.—After what has been said it will be evident that little can be done in the way of treatment for these cases. Attention to the nose and ear, when these are affected by disease, will serve as a prophylactic measure. When the abscess has really formed operation may be resorted to, and successful cases have been placed on record.

INFANTILE CEREBRAL PARALYSES.

Under this heading we shall briefly describe a number of interesting if somewhat obscure conditions. These include spastic hemiplegia, paraplegia, and diplegia.

Etiology.—These paralyses are met with in children fairly frequently. The exact cause has not as yet been ascertained. At the same time we know that a certain number of them occur during intra-uterine life, while the actual birth of the child is accountable for some cases. When the condition develops after birth, it may occur in children who are perfectly healthy, in the same way as infantile spinal paralysis usually occurs. It is possible, therefore, that the ultimate cause may be one and the same in both diseases. Paralysis in one or other of its cerebral types has been met with after measles, scarlet fever, and even after pneumonia, while in not a few cases there has been a history of preceding and frequent convulsive seizures.

Symptoms.—In the majority of cases the condition met with is a hemiplegia; much more seldom is it one of paraplegia, or of diplegia. As regards the side affected in hemiplegia, the numbers are about equal of right- and

of left-sided cases. The distinguishing feature of all cerebral paralyses is the spasticity. The reflexes are exaggerated, and the affected limbs show a distinct amount of rigidity. In walking the child tends to progress on his toes, and in the worst cases the legs are crossed as he walks. Curious contractures and athetoid movements are not uncommonly met with, while convulsive seizures are extremely common. Cases that occur during intra-uterine life, or that develop during infancy, tend to be affected mentally. Intelligence becomes distinctly impaired, and such children are late in walking, and are unable to speak when two or more years of age. Their mental development is always very backward, and indeed not a few of these cases unfortunately become hopeless idiots.

Contractures as a rule set in comparatively early, and give the child a very characteristic appearance. A certain number of these cases undoubtedly become epileptic. Paraplegia and diplegia are perhaps more commonly met with in those cases which develop during intra-uterine life, or during the birth of the child; whereas hemiplegias are more liable to come on at a later period.

Diagnosis.—The presence of spasticity with increase of the reflexes, and contractures or athetoid movements, serve to distinguish these cases from those of spinal paralysis, in which we have developed flaccidity with diminution of the reflexes and a distinct degree of muscular atrophy. Chorea is a condition which is sometimes mistaken for athetosis, but a careful examination of the patient will usually suffice to clear up this difficulty.

Prognosis.—The prognosis is unfortunately not very hopeful, because a certain number of these cases either become idiots, or go to swell the ranks of epileptics. In

some instances a certain amount of recovery takes place, but complete cure is probably never obtained.

Treatment.—If the case is met with as an acute condition the patient must be kept absolutely quiet, and a dose of calomel administered together with small but frequently repeated doses of sodium bromide. As regards the treatment of the actual paralysis which remains, massage and electricity may be employed, in some cases with a considerable degree of success. The chief point to be attended to is to avoid anything like an over-energetic use of either of these two therapeutic measures. Hot baths, together with passive movement of the affected limbs, often tend to ameliorate the conditions of contracture and rigidity. Otherwise little can be done for these patients in the way of treatment.

HYDROCEPHALUS.

This occurs in two forms. The fluid may be found either in the subdural space, in which case it is termed *external hydrocephalus*, or it may make its appearance in the ventricle, when it is known as *internal hydrocephalus*. The condition may also occur either acutely or as a chronic disease. It is the latter, however, which is the more important, and therefore our remarks will apply more particularly to this variety.

Etiology.—The condition may be a congenital one, and may be met with in apparently absolutely healthy infants. In other cases it may be associated very closely with a history of parental alcoholism, syphilis, or tuberculosis. The acquired variety is extremely rare, but does occur in infants who are the subjects of rickets, or in those who are suffering from intense anæmia.

Symptoms.—The chief symptoms presented to us in these cases is a steady and progressive enlargement of the skull. The fontanelles are found to be large and the margins much thinned. The occipital and frontal bones are extremely prominent, and in many instances a very distinct depression can be made out between the anterior and posterior parts of the cranium. All the bones of the skull are considerably thinned. Nystagmus is often a concomitant symptom. Convulsions are common, and in consequence of the large size and weight of the head the child is unable to support it. These convulsive seizures are very commonly followed by paralysis.

If the child lives long enough he will probably become more or less mentally deficient, while many of these cases eventually become hopelessly imbecile.

Diagnosis.—The only practical difficulty in diagnosis is to distinguish the rachitic from the hydrocephalic condition of the skull. In many instances the two conditions, in fact, are conjoined. In hydrocephalus, however, the skull measurements are found to steadily increase, whereas in a purely rachitic case this will not be so. The history of the patient will usually afford a sufficient guide to the diagnosis of hydrocephalus from that of rachitis.

Prognosis.—While a certain number of cases recover many of them die at an early age. Those who develop hydrocephalus a considerable time after birth are less likely to succumb. The great danger, should recovery take place, is that these children become mentally affected.

Treatment.—This may be either medical or surgical. As regards the former, mercurial inunction and general tonic treatment frequently meet with a certain degree of success. Drainage may be employed by tapping the

lateral ventricle or by puncturing the spinal membranes in the lumbar region. The risk of these procedures, however, is by no means a small one, and therefore they should never be employed without previously explaining this to the parents.

DISEASES OF THE SPINAL CORD.

ACUTE MYELITIS.

This is an extremely rare condition either during infancy or childhood.

Etiology.—This disease may be associated either with injury, or may develop in connection with one or other of the acute infectious fevers. Rheumatism as a cause is of much less importance.

Symptoms.—These will vary according to the area of the cord with which the inflammatory process is associated, and generally speaking the symptoms present during childhood are exactly similar to those met with in this disease as it affects adults.

Diagnosis.—The diagnosis of myelitis in children has to be made from meningitis, and also from hysterical paralysis.

Prognosis.—This depends to a great extent upon the nature of the lesion and the portion of the cord which is involved. Paralyses and contractures are very liable to result and to remain as permanent conditions.

Treatment.—Absolute rest in bed with the administration of bromides, combined with iodides, is the method of treatment to be adopted in every case. After the acute stage has passed over electricity and massage should be employed.

INFANTILE SPINAL PARALYSIS.

(Poliomyelitis Anterior Acuta.)

This is by far the most common form of spinal cord disease which is met with in children.

Etiology.—The exact cause of this affection has not, up to the present time, been definitely made out. In some cases it occurs in association with certain of the infectious fevers, such as measles and scarlet fever. In other instances a history of injury has been obtained. The probable ultimate cause is a micro-organism, and this view is supported by the fact that the disease sometimes occurs in epidemics, while it is also much more common during the warm summer and autumn months. The supposition that it is due to embolism of certain of the branches of the anterior spinal artery is one which has much to commend it.

The disease may be met with either in infancy or early childhood, and it is most commonly found to occur during the first five years of life.

Symptoms.—It is not until the paralysis has supervened that the nature of the disease is recognised in the majority of cases. At first there are very often catarrhal symptoms present, which are either overlooked altogether or their origin attributed to a simple attack of cold.

In some cases we find in addition nausea and vomiting associated with convulsions. In many instances the temperature is considerably raised, but as a rule these initial symptoms do not last for more than a few hours, or at the outside a few days. They usually rapidly disappear and leave the child typically paralysed.

At first the paralysis is fairly extensive, and may affect

all the four limbs. In a short time, however, this extensive involvement diminishes and only one or two limbs or part of a limb remains paralysed. The permanent paralytic condition usually affects the lower rather than the upper extremities. Paraplegia and monoplegia are the forms of paralysis most frequently met with; hemiplegia is exceedingly rare. In some cases a single group of muscles may alone be affected. When the paralysis has become established wasting rapidly ensues. The affected limb hangs from the body in a helpless condition. The reflexes are abolished, and the skin becomes cold and clammy.

The electrical reactions are of very great importance in establishing the gravity of the particular case under observation. The affected parts give a well-marked reaction of degeneration, and those muscles which fail to respond to the faradic current may almost certainly be predicted to remain permanently paralysed.

Contractures are very apt to supervene, more especially in those cases which are left untreated for any length of time. Thus we find talipes equinus and talipes equino-varus developing in some instances. A claw-like hand is occasionally met with, but is, of course, much less common than the deformities already mentioned.

In a few cases complete recovery takes place, but as a general rule a greater or less degree of permanent paralysis remains.

Diagnosis.—During its onset acute spinal paralysis may be mistaken for *meningitis*, as in both conditions convulsions and even coma may be present; but in meningitis there are other and more definite features, such as headache, strabismus, and retraction of the head. When the paralysis has fully developed the diagnosis has

specially to be made from *acute cerebral paralysis.* In the latter condition we have spasticity in association with but slight atrophy and marked rigidity of the affected limbs. The reflexes are exaggerated, and there is no alteration in the electrical reactions. Cases of *neuritis* have to be distinguished from acute spinal paralysis, and this is not always an easy matter, although in neuritis pain and exquisite tenderness along the line of the nerves is fairly characteristic.

In *rachitis* and *scorbutus* there often exists a condition which resembles very closely spinal paralysis. As a rule these children are brought either on account of their inability to walk, or because of the extreme pain and tenderness in the limbs. The history of the case, together with the appearance of the child, and, in the case of scorbutus, the involvement of the joints, usually afford sufficient points of distinction.

Prognosis.—As regards recovery the prognosis is fairly good, although a certain amount of paralysis probably remains in every case. Much will depend upon the condition of the electrical reactions and the care with which the treatment is carried out.

Treatment.—If the case is seen during the initial stage the patient should be treated on general principles, such as would be employed in any ordinary febrile condition, while in addition the application of cold over the portion of the spine affected might be advised. For the paralysis massage of the affected muscles is the most suitable form of treatment. This not only aids the nutrition of the parts, but it also prevents the formation of contractures. It is also a good plan to keep the affected limb or limbs wrapped up in cotton wool in order to maintain the circulation. The galvanic current may

be applied to the affected muscles, but it should not be used either too energetically or for too long a period at any one time. Surgical operations may be recommended for the cure of deformities in chronic cases, and the general health and hygiene of the patient should be carefully attended to in every instance.

COMPRESSION MYELITIS.

(Pott's Paralysis.)

Compression myelitis is so often the result of caries of the spine, that it is perhaps unnecessary to consider any other possible cause, such as tumours and aneurysmal disease.

Etiology.—Pott's paralysis, as it is termed, is usually met with during childhood, and is an evidence of tuberculosis. The condition is usually brought about by a fall or blow on the back. This leads to a carious condition of the bone, so that it becomes displaced. The compression of the spinal cord, however, is not always due to pressure of the affected bones, but rather to the presence of the products of inflammation in the meninges of the cord itself.

Symptoms.—As a rule compression myelitis comes on somewhat insidiously, though at times the onset may be somewhat sudden. In the majority of cases the lower extremities show a definite spastic paralysis with increase of the reflexes, and very frequently this is preceded by sensations of numbness and weakness in the affected limbs. When the sensory nerve roots are compressed neuralgic pains are usually complained of. A certain degree of atrophy in the affected limbs may be observed, but the reaction of degeneration is absent. Bed-sores are

very liable to occur, but trophic conditions do not usually form a marked feature of the case.

Diagnosis.—This is not always an easy matter. The disease may readily be mistaken for ordinary myelitis; while spastic paraplegia, resulting from cerebral paralysis, may erroneously be diagnosed as compression myelitis. In poliomyelitis as a rule we find loss of reflexes, together with the reaction of degeneration, neither of which are present in a case of Pott's paralysis. The fact that compression myelitis generally occurs at a much later period of childhood than cerebral paralysis is of some service in establishing the diagnosis, while affection of the vertebræ in the former condition will make the nature of the disease absolutely certain.

Prognosis.—Recovery usually occurs under treatment, especially in the less serious cases. In a certain number, however, the bone disease tends to progress, while in others the affection of the spinal cord is apt to become more and more extensive.

Treatment.—The treatment of this condition is partly medical and partly surgical. In all cases absolute rest in bed with the application of extension should be tried; while in addition tonics, such as cod-liver oil, may be prescribed with advantage. Gentle massage and the application of a mild electric current are sometimes found serviceable in improving the condition of the paralysed limbs. The surgical treatment consists in performing the operation known as laminectomy, in order to remove the portions of diseased bone and the inflammatory products which have been formed by the latter.

TUMOURS OF THE CORD AND ITS MEMBRANES.

These are very rarely encountered during childhood. Gummata, gliomata, and cysts are, however, occasionally met with.

Symptoms.—Pain is usually the outstanding feature in all these cases. In addition there will be resulting paralysis, the distribution of which will depend entirely upon the part of the cord involved. The size and position of the tumour will naturally modify the symptoms presented in any particular case.

Diagnosis.—This has to be made from compression myelitis, from simple meningitis of the cord, as well as from the ordinary forms of myelitis.

Prognosis.—As a rule death is the inevitable result, although in a few cases surgical interference may not only afford distinct amelioration of the symptoms, but ultimately lead to a complete cure

Treatment.—With the exception of gummata, which may be treated by the use of mercurial inunctions and the internal administration of iodides, little if any success can be expected from the exhibition of drugs. Surgical operation is the only available means of treatment in the majority of these cases, and even this does not hold out any very great probability of cure.

HEREDITARY ATAXIA.

(Friedreich's Disease.)

Although this is a comparatively rare disease, it is undoubtedly one of very great interest and importance. The lesion is situated either in the posterior columns or in the posterior and lateral columns of the cord.

Etiology.—The only known fact regarding the etiology of this disease is that it is usually met with in several members of the same family. It seems to affect males rather than females, and as a rule begins at a comparatively early age. Recently, however, we met with a case in which the initial symptoms did not make their appearance until the age of nineteen.

Symptoms.—These present quite a definite group. We have, first of all, the ataxic gait, so that the child walks upon a broad base in a somewhat unsteady manner. Romberg's symptom is not always present, but when it is met with, it is always perfectly characteristic. The knee-jerks are lost; and in addition we have developed a kind of intention tremor, and a peculiar oscillatory movement of the head, which are both very highly suggestive of multiple cerebro-spinal sclerosis.

Sensory changes are usually conspicuous by their absence, although in a few recorded cases lightning pains formed a very pronounced symptom. Deformity of the foot, moreover, sometimes forms a very marked feature in these cases.

Certain points are of special importance in suggesting the close relationship between this disease and that of multiple cerebro-spinal sclerosis. In both we have, as already mentioned, the intention tremors and the peculiar movements of the head, while vertigo and a peculiar hesitating and staccato speech are met with in both diseases. Moreover in the one, as in the other, the condition tends to progress until the patient becomes completely paralysed, bedridden, and a more or less helpless imbecile.

Diagnosis.—This has to be made from multiple cerebro-spinal sclerosis, and also from ordinary locomotor ataxy, as well as from hereditary cerebellar ataxy or Marie's disease.

Prognosis.—This disease is absolutely hopeless as regards ultimate recovery. The symptoms usually progress steadily and persistently, although at times a certain degree of amelioration seems to take place.

Treatment.—The use of massage and electricity to the limbs, combined with hot baths, may be tried. Otherwise nutritious dieting and the administration of tonics are the only means at our disposal.

PROGRESSIVE MUSCULAR ATROPHIES AND DYSTROPHIES.

A large variety of conditions fall to be considered under this heading. We have, first of all, a large group of cases in which the disease is no doubt situated in the spinal cord. In other cases the pathological change occurs in the peripheral nerves themselves; while in a third group the primary lesions are situated in the muscles themselves.

Etiology.—Nothing is definitely known regarding the cause of these various forms of disease. Heredity, no doubt, plays an important part in some cases, while injury may occasionally be given as a cause.

Symptoms.—In those cases in which the lesion is situated in the anterior horn cells, as well as in the lateral tracts of the cord, we find the loss of power and atrophy of the muscles first in the upper extremity. The main-en-griffe becomes developed. The muscles of the shoulder also become affected, while sooner or later those of the lower extremity are involved. When the lesion is primarily in the nerves the atrophy assumes the peroneal type, so that the condition begins in the lower extremities, although more rarely it starts in the hands.

Those cases in which the lesion is primarily in the muscles themselves supply us with quite a definite symptom group. Thus, under the term *Pseudo-hypertrophic Paralysis* we have a very typical and characteristic clinical picture presented to us. The child shows special difficulty in climbing upstairs, dragging one foot clumsily after another. In rising from the ground he, as it were, climbs up his legs. The muscles, especially those of the calves, become greatly hypertrophied; while others, notably those of the thighs, shoulders, and back, become markedly atrophied. Various deformities are apt to supervene, and eventually the child may become hopelessly paralysed. This is certainly the most common form of this disease; but another type has been described, known as the *Atrophic*, in which we have the muscles of the face and shoulder primarily involved, and in which hypertrophy never forms a marked feature. In still a third group of these primary muscular affections, known as *Erb's Juvenile Type*, the disease starts in the muscles of the shoulders, which become distinctly atrophied.

Diagnosis.—The diagnosis of these various forms of muscular atrophies and dystrophies from one another can sometimes be readily made by observing the muscles which are first involved in the course of the disease. In pseudo-hypertrophic paralysis the difficulty which the child has in rising from the ground, and the method he adopts in assuming the erect attitude, are usually characteristic.

Prognosis.—Although the lives of these patients may be prolonged for many years, they usually become helplessly paralysed and bedridden, and are thus rendered specially liable to attacks of acute disease.

Treatment.—Beyond the employment of massage and

electricity, and the careful dietetic and tonic treatment of the patient, little can be said regarding the treatment of conditions the nature of which is but little understood.

SPINA BIFIDA.

This is a congenital condition of the spinal cord, and as it is occasionally met with in practice a short reference may be made to it in this place. It is due to defective closure of the vertebral arches, and this is most frequently met with in the lower or lumbar part of the cord. Four different varieties have been described:—

1. *Spinal Meningocele.*—In this condition we have simply a protrusion of the spinal membranes.

2. *Meningo-myelocele.*—This is by far the most common variety, and here we find the spinal cord as well as the membranes included in the tumour.

3. *Syringo-myelocele.*—Here we have not only the membranes and cord, but also the central canal of the latter present as well.

4. *Spina Bifida Occulta.*—In this variety we find nothing more save a very small tumour, which on section proves to be merely an empty sac.

Symptoms.—This is a malformation which is usually associated with other developmental defects, the most common of which is undoubtedly some form of talipes. On examination of the back a definite tumour is made out, which may vary considerably in size. It is, moreover, usually situated in the lower part of the lumbar region. This tumour appears in the middle line, and may have as a covering normal skin, or simply a thin and somewhat transparent membrane. Provided the infant lives, paralysis of the lower limbs is almost certain to develop,

while enuresis is very often found in association with spina bifida occulta.

Diagnosis.—The position and character of the tumour, together with its congenital nature, are the two points on which the diagnosis usually rests.

Prognosis.—A large number of these cases die soon after birth, convulsions very often making their appearance. In other cases the child lives for some time, but eventually becomes paralysed. In a third group we find that the sac tends to become obliterated, and in these cases complete recovery may take place.

Treatment.—The only satisfactory mode of treatment is by surgical operation, but this does not always meet with success. Apart from this, the avoidance of pressure upon the sac and the treatment of resulting deformities and paralysis must be attended to.

DISEASES OF THE PERIPHERAL NERVES.

Certain of the diseases of the peripheral nerves have already been considered in an earlier chapter (*vide* p. 15) to which the reader is referred. In this chapter, therefore, we shall only deal with one or two conditions which may be met with in childhood.

FACIAL PARALYSIS.

Paralysis of the seventh nerve is not uncommonly met with in children, and accordingly a short account of it may be given.

Etiology.—The two most common causes of facial paralysis in childhood are exposure to cold and disease of the ear. Much less frequently it occurs in association with cerebral affections. Facial paralysis may be met with at

almost any age, but is most commonly seen between the ages of five and twelve years. When it occurs in association with middle ear disease it frequently follows upon an attack of scarlet fever, while in cerebral cases facial paralysis may be developed in connection with acute meningitis.

Symptoms.—The patient is unable to close the eye completely on the affected side. He cannot puff out the cheeks, nor can he put the mouth into shape for whistling. When asked to expose the teeth by retracting the lips, the mouth will be drawn away from the paralysed side. When the patient puts out his tongue it turns towards the sound side.

When the paralysis is the result of middle ear disease it is associated with aural discharge and impairment of hearing. When the lesion is a central one there may be affection of other nerves as well, and very commonly the condition is associated with hemiplegia.

Diagnosis.—In distinguishing whether the lesion is a peripheral or a central one, we rely on the fact that in peripheral paralysis the patient is unable to close the eye, whereas in central lesions there is no difficulty in doing so. Moreover, in central lesions the facial paralysis is generally associated with a hemiplegia.

Prognosis.—Recovery as a rule takes place when the lesion is a peripheral one, although several weeks may elapse before any signs of improvement are observed.

Treatment.—In the variety of paralysis which is due to exposure, rest in bed with probably hot fomentations applied over the affected side of the face is all that is required. When associated with ear disease operation should be resorted to. In cerebral cases no special treatment is required. When the condition shows no sign of improvement, the mild application of the galvanic current

will be found helpful in bringing about recovery in the affected nerve.

MULTIPLE NEURITIS.

Another term for this disease is polyneuritis, or peripheral neuritis. It indicates an inflammatory condition of the nerve or nerves involved.

Etiology.—Perhaps the most frequent cause of peripheral neuritis in children is diphtheria. Alcohol, unfortunately, is also productive of this condition, even in quite young children; occasionally arsenical and lead poisoning give rise to it. In rare instances it is found associated with tuberculosis and with rheumatism.

Symptoms.—As peripheral neuritis in childhood is so often the result of the diphtheritic toxin, we shall confine our attention more especially to this variety, which is known as diphtheritic paralysis. In some cases of this condition we have a definite history of an actual attack of diphtheria. In other cases, however, and these are by no means infrequent, the child is brought to us suffering from the symptoms of typical neuritis, although no previous diphtheritic history is obtainable. In these latter instances, however, on closely questioning the parents, we are usually able to make out a history of pre-existent sore throat.

As regards the definite symptoms of peripheral neuritis, we may find that the extremities are specially involved. Thus we have pain and tenderness along the distribution of the principal nerves, and a distinct impairment in the muscular movements. In the upper extremity we are apt to have wrist drop, while in the lower limbs drop ankle is very often present. The reflexes are usually completely abolished, or at all events considerably diminished. The

paralysis may involve all four extremities, or it may be more localised. Paralysis may affect more especially the palate, in which case food will be found to come back through the nose, and there will be difficulty in speaking. The eye muscles, on the other hand, may be specially involved, and the patient's sight will then become more or less affected, so that he is unable to read and the pupils become dilated, while the phenomenon of diplopia is developed. In peripheral neuritis, from whatever cause arising, the electrical reactions are usually more or less altered, and even the reaction of degeneration may become developed.

Diagnosis.—The only disease which is likely to be mistaken for peripheral neuritis is infantile paralysis. The factors on which we rely for a differential diagnosis are that in infantile paralysis there is no special pain along the course of the nerves, and that the paralysis is, as a rule, more widespread and less symmetrical than in peripheral neuritis. It sometimes happens that in children we have paralysis of an hysterical nature developed, and in such cases we must rely on the condition of the reflexes which are usually present in these cases. Whenever a case of peripheral neuritis presents itself it is well to inquire as to the possibility of its diphtheritic origin.

Treatment.—The cause of the disease should, if possible, be removed. As regards the actual treatment, the patient must be kept at rest. For the pain, hot fomentations may be applied; otherwise, massage and electricity will be found of most service. When the condition is brought about by the toxin of diphtheria tonic treatment is always indicated, cod-liver oil emulsion forming one of the best preparations at our disposal.

GENERAL DISEASES OF THE NERVOUS SYSTEM.

CONVULSIONS.

Convulsions are so common during the periods of infancy and early childhood, that they may almost be regarded as a distinct entity. It must be remembered, however, that unlike epilepsy, a convulsive seizure is merely a symptom and not an actual disease.

Etiology.—The nervous system in infants and young children is so unstable that its equilibrium is readily upset by very slight causes. Convulsions in children very often take the place of rigors in the adult. Thus it is not uncommon to find many of the infectious fevers, and also pneumonia, ushered in by one or more of these seizures. In such cases we find that the temperature, as in rigor, is raised. One condition especially in which we find convulsions as an initial symptom is that of influenza. In rachitic children the dentition period is apt to be marked by the occurrence of many of these attacks. Perhaps the commonest of all causes of convulsions is gastro-intestinal disturbance, usually brought about by improper feeding and the use of artificial foods. Nervous shock may also bring on convulsions, and this shock may be occasioned either by fright, or even by the application of too hot a poultice to the chest. The tendency to convulsive seizures diminishes markedly after the fifth year of life, and they are most frequent during the period of infancy.

Description of a Convulsive Seizure.—As a rule the patient becomes stiff and rigid. The eyes are fixed and the lips become blue. This constitutes the tonic stage, in which the respiration is arrested. It is rapidly followed by the clonic or more truly convulsive stage, in which the

limbs are moved more or less violently about, and the fingers are clenched, the thumbs being buried in the palms. The head is drawn back and the face becomes pale, the breathing being deep and stertorous. Eventually the movements cease, and the limbs become quite flaccid. The child then passes into a state of repose, very often followed by deep sleep.

Diagnosis.—The diagnosis is usually a matter of no great difficulty, but it sometimes happens that we have to distinguish between simple convulsive seizures and the much graver condition of epilepsy. In the latter disease it is usually noticed that we have at first a partial disturbance, which may, after a time, become generalised; whereas in the case of simple convulsive seizures the condition is generalised from the very outset.

Prognosis.—Generally speaking this is quite favourable, and as a rule the condition underlying these convulsions is very amenable to treatment. In some cases these attacks follow rapidly one upon another, and in such cases the prognosis becomes less hopeful.

Treatment.—When the patient is actually suffering from a convulsive seizure, cold should be applied to the head and warmth to the feet. A handkerchief or sponge, wrung out of cold water, fulfils the former indication, while a hot mustard foot-bath is the simplest method of carrying out the latter. Should these measures fail inhalations of chloroform may be resorted to, while in severe cases an enema of chloral hydrate may be administered.

When the attack is over we must set ourselves to discover the underlying cause with a view to its removal. As some gastro-intestinal disturbance is usually the error requiring correction, powders containing hydrarg. subchlor.

and sod. bicarb. may be prescribed with advantage, while at the same time the diet of the patient should be carefully revised. When convulsions occur in association with high temperature, at the outset either of pneumonia or of one of the infectious fevers, tepid sponging will be found to afford great relief. In rachitic children the treatment of this condition is always indicated, and in many of these cases it may be necessary to administer some sedative, such as phenazonum, combined with sod. brom. in small doses.

EPILEPSY.

This disease very frequently makes its first appearance during childhood. Its symptoms and course vary little from those which it presents when met with in later adult life.

Etiology.—The condition may start even during infancy, but it is most frequently found to begin about the period of puberty. Heredity plays a very important part in its causation, while a history of hysteria, or even of insanity, in the family can often be made out. It is also well known that children of alcoholic parentage frequently become epileptic. Statistics, indeed, go to prove that syphilis and alcoholism are two of the most potent factors in its production. A certain number of cases result from distinct traumatism.

Symptoms.—As in adults, so in children, we meet with two varieties of epilepsy. There is, first, what is known as the *Petit Mal.* In this condition the child is noticed to stand motionless for a few seconds, or if he is speaking he suddenly stops short. His eyes look fixedly into space, and the facial expression has a far away appearance. Occasionally it happens that in addition there is a certain

degree of vertigo, and with it there may be slight twitchings of one or more parts of the body. Sometimes this milder form of epilepsy is recognised by the child having attacks in which he suddenly forgets what he is about to do or say. Unfortunately, when medical advice is not obtained, the parents are very apt to suppose that the child is subject to simple fainting fits, and the condition remains unrecognised for years, until perhaps the more typical second variety, or *Grand Mal*, is developed. Preceding these more pronounced attacks we have usually an aura of some kind; this may take the form of some sensory disturbance, such as numbness, tingling, or actual pain in some part of the body. It may be a motor aura in which there is twitching, perhaps of a thumb, an eyelid, or of some other part. Either with or without an aura the attack commences with a cry, the child loses consciousness and becomes stiff and rigid. This constitutes the tonic stage, which is rapidly followed by the clonic, in which we have more or less violent movements of the limbs, while the hands are clenched, the thumbs being buried in the palms, and the tongue is apt to be bitten during the attack. Then the spasm passes off, and the child falls into a profound slumber. During the clonic stage the movements may be generalised, or we may find one part of the body more affected than another. When we find this partial condition present we are able to recognise the fit as being due to an organic disease of the motor cortex.

Patients who are the subjects of epilepsy are apt to become mentally deteriorated. They may be dull and stupid, and are often violent.

Diagnosis.—Petit Mal has to be distinguished from simple fainting attacks; in the latter, however, recovery

is usually rapid, whereas in Petit Mal the patient is either drowsy, or at all events stupid for some time afterwards. Ordinary epileptic seizures may readily be mistaken for hysterical manifestations, and it is not always an easy matter to distinguish between the two. Generally speaking, an attack of true epilepsy is of short duration, whereas that of hysteria is apt to be somewhat prolonged. Hysterical seizures usually occur at much more frequent intervals than do attacks of true epilepsy. Moreover hysteria is usually associated with other evidences of the condition, which make it more readily distinguishable from that of epilepsy.

It is important in every case to make out whether or not the condition is the result of organic cerebral disease. The nature of the seizure should therefore be carefully inquired into, and the presence of a definite aura in some part of the body may give a distinct clue to the seat of the cerebral lesion.

Prognosis.—The outlook in epilepsy is not very hopeful at the best. Life is not necessarily short, but the mental condition of these patients is apt to be greatly impaired. The earlier the disease begins to show itself the less chance of cure can be held out.

Treatment.—The management of a case of epilepsy may be considered under four headings:—

(1) *Dietetic and Hygienic Environment.*—The patient should be kept on a diet largely consisting of milk, fruit, and vegetables. Abundance of fresh air is also indicated, while attention to the skin and gastro-intestinal tract is of the greatest importance.

(2) *Mental Rest.*—By this we mean that there must be no over-anxiety to educate the child. His education must be carried on leisurely, and in a manner suited to

individual requirements. The strain school life undoubtedly involves has very often a distinctly injurious effect upon these patients.

(3) *Medicinal Treatment.*—When all has been said, the fact remains that sodium bromide holds the first place in the treatment of epilepsy. When the administration of this alone fails to bring about an amelioration in the patient's condition, then phenazonum may be combined with it. Occasionally tinct. belladonn. may be given with considerable advantage.

(4) *Surgical Interference.*—This is only available for those cases in which we have partial epileptic seizures, indicating the presence of a distinct cerebral lesion.

CHOREA.

Next to epilepsy, chorea is probably one of the most interesting of all the nervous diseases met with during the period of childhood. It is a disease round which much controversy has been carried on. We need not, however, discuss the various points at issue, but shall be content with describing the disease, and referring the reader to the chapter on the rheumatic affections of childhood for further information.

Etiology.—Chorea is rarely met with before the age of five years, and the largest number of cases are found to occur about the age of puberty, although it is quite common between these two age limits. The condition may, however, be met with during the period of infancy. As regards the influence of sex in its causation, chorea is much more frequently met with in females. Heredity seems to play an important part in its production in certain instances, as when the family history

comes to be inquired into it is often found that one or both parents have been affected with nervous disease, if not actually with chorea itself.

The disease is predisposed to by any condition which tends to lower the general health of the patient. Thus it may occur during convalescence from certain of the infectious fevers. The strain of school life, again, must not be forgotten as a very potent factor in its production. It may arise from certain reflex causes, such as sudden fright. The presence of adenoids and errors of refraction are often mentioned as causes of chorea, but in our experience these must be regarded as very insignificant. The presence of intestinal parasites may be noted in association with chorea. Recently we have had occasion to refer to two cases in which the tænia solium was the underlying factor in the production of severe chorea. We doubt very much, however, if true chorea really ever occurs apart from a rheumatic predisposition, or it may be a definite history of rheumatism, either in the patient himself or in the family. Rheumatism is far and away the most important cause of chorea in childhood. In fact we might almost say that chorea is in reality a purely rheumatic manifestation.

It may be after all that the nervous restlessness, which is so often present in rheumatic children, when it reaches a certain maximum point becomes associated with those muscular movements which we recognise under the name of chorea. If this is the true explanation of the origin of this disease, then chorea is nothing more save a peculiar muscular irritability superadded to a pre-existing state of nervous unrest.

Symptoms.—The picture presented by a child suffering from an attack of chorea is too well known to require any

detailed description. At the commencement it is often noticed that the patient is more than usually nervous and easily startled. He frequently lets things drop from his grasp. At other times it is noticed that he makes curious grimaces. When the disease is fully developed the affection is most marked in the extremities. The movements are spasmodic in character. The limbs are jerked about in a curiously irregular fashion, the movements being always aggravated when the patient is under observation, or when any attempt is made to use the limbs. The muscles of the face, especially those of expression, are frequently involved, so that the features are thrown into curious contortions. The tongue is often protruded in a jerking manner, and as suddenly withdrawn. Speech may be affected so that it becomes difficult and indistinct. In bad cases the muscles of deglutition, and even those of respiration, may become involved.

The reflexes may be diminished, but in the majority of cases they are not at all interfered with. During the course of the disease the amount of urea eliminated is usually found to be more or less in excess of the normal, while the percentage of phosphates is always increased.

Cardiac affections are frequently met with, mitral disease being extremely common, while in every case a greater or less degree of cardiac dilatation will be found to exist. Other rheumatic manifestations may be developed during an attack of chorea, apart altogether from heart affections, such as, for example, certain cutaneous disorders and myalgia.

Diagnosis.—The diagnosis of chorea is a comparatively simple matter. The only difficulty that may arise is to distinguish this affection from the condition of nervousness. The distinguishing features of chorea are a curious

jerky movement which is increased on attempts at any voluntary action, and the greater liability to involvement of the muscles of expression.

Prognosis.—The disease may run a protracted course, the average duration being generally about three months, although milder cases often recover within a much shorter period. The prevalence of cardiac complications, and the relation of the disease to rheumatism, make the ultimate prognosis less hopeful. Repeated attacks are also fairly common, and these are often found to be more aggravated than the original one. Cases in which the muscles of deglutition and respiration are affected are usually of a serious nature, while a very rapid pulse and a progressive rise of temperature are to be regarded as very ominous signs.

Treatment.—The medicinal treatment of chorea should always hold a secondary place. First and foremost we must place absolute rest in bed and a strictly milk diet. In addition, warm baths and gentle massage of the limbs generally produce a beneficial effect. The remedy which has found most favour in the treatment of chorea is arsenic. This may be given in the form of liquor arsenicalis, which is usually well borne by children. The initial dose should be two minims, and this may be increased up to 10 or even 15 minims, well diluted, after meals. Certain other mineral preparations have from time to time been suggested, among which may be mentioned the oxide of copper, which may be given in the form of cuprol. Phenazonum has been given with success in a number of cases, especially in those which are of reflex origin. As, however, we are firmly convinced of the rheumatic nature of chorea, we must insist upon the advantage to be derived from the administration either of salicylate of soda, or of

aspirin, in every case of the disease. The latter is to be preferred as it is much more pleasant to take, and besides is much less liable to produce nausea on the part of the patient. To a child of ten years we may give 10 grains every four hours, smaller doses being practically without effect. We have known cases in which arsenic had been given in gradually increasing doses for several weeks without apparent result, but when aspirin was substituted gradual amelioration of the symptoms was brought about. Of course in a disease such as chorea it is extremely difficult to dogmatise on the subject of the therapeutic action of any drug, but we are convinced that in aspirin we have one which will be found of signal service in the majority of cases.

TETANY.

Although this can scarcely be regarded as a distinct disease, but rather as a definite symptom group, we have no other alternative but to consider it under a separate heading.

Etiology.—It is most commonly met with during the period of infancy. There can be no doubt whatever that the presence of rachitis has a marked influence in its production. Gastro-intestinal disturbance must also be regarded as a predisposing factor, and we have known it to occur during the height of an attack of broncho-pneumonia. Its association with laryngismus stridulus is extremely interesting; indeed some authorities seem to regard the latter condition as merely a latent form of tetany.

Symptoms.—The condition of tetany is characterised by symmetrical contraction of the extremities. The hand is flexed at the wrist, and the thumb is closely buried in

the palm of the hand. The fingers are flexed at the metacarpo-phalangeal joints, but the terminal phalanges are extended. The feet are likewise found to be extended, while the toes are adducted, as in the characteristic deformity known as talipes equinus. In some cases the arms are found to be flexed at the elbow joints, while in a few instances the muscles of the chest and abdomen are involved.

In addition to the presence of these characteristic contractures we have pain, which is often very severe. When we tap upon the facial nerve in front of the ear we find twitching of the facial muscles set up, and by compressing the arm or leg we may be able to produce contracture of the hand in one case, and of the foot in the other. Attacks of tetany are liable to follow one another at longer or shorter intervals, during which laryngeal spasm may be met with.

Diagnosis.—In determining the diagnosis of tetany we must have regard to the symmetrical nature of the contractures, and the preservation of consciousness throughout the attack.

Prognosis.—Probably every case of tetany would ultimately recover were it not for the fact that in some instances it is associated with serious respiratory disease. Cases in which the condition develops during the course of rachitis almost always make a good recovery.

Treatment.—Attention must be directed to the removal of any reflex exciting cause, such as gastro-intestinal disturbance; otherwise we must try to tone up the nervous system of the child by douching of the spine, and by treatment of the general rachitic condition underlying the disorder. For this purpose strict attention must be paid to the feeding of the patient. All starchy

food must be avoided, and a sufficiency of fat administered. Cod-liver oil is always indicated in this condition. When tetany is of a severe and prolonged nature it may be found necessary to order one or more grains each of phenazonum and sodium bromide.

HYSTERIA.

The statement that this disease is of fairly common occurrence during childhood is apt to prove at first sight absolutely erroneous; but those who have studied child life with considerable attention can only arrive at one conclusion, namely, that hysterical manifestations are becoming more and more frequent in early life.

Etiology.—Heredity has a considerable influence on the production of hysteria. Children who exhibit this tendency are usually found to spring from a nervous parentage. Apart from this the pressure necessitated by modern methods of so-called education is exceedingly liable to lead to the production of hysteria in those whose nervous system is somewhat unstable. Although in later life hysteria is probably more commonly met with in the female, in childhood we claim that both sexes may be equally affected. In early life there is no age limit which may be given as that during which this condition is most prevalent; in fact a species of mental disturbance to which the designation of hysteria may quite accurately be given is exceedingly common before the age of three.

Symptoms.—It is impossible to give anything like a complete account of the various manifestations of hysteria, so numerous and complex are they. As in the adult so in the child, hysteria may simulate almost any diseased condition. Probably the most common class of case,

however, which we meet with is that in which the mental element is most marked. Such children are apt to be exceedingly emotional and passionate. Apart from this, we may meet with sensory and motor disturbances which can only be explained on the assumption that they are of neurotic origin. Attacks which may closely resemble true epilepsy are not infrequently met with in children, and it is not always an easy matter to arrive at a correct differential diagnosis.

Affections of the joints, which in some respects simulate tuberculous disease may be met with, while vague pains in various parts of the body often mislead the unsuspecting practitioner.

Prognosis.—In some cases, more especially those which develop hystero-epilepsy, the prognosis is unfavourable; otherwise many of these cases recover when properly treated.

Diagnosis.—This is sometimes quite an easy matter. At other times, however, especially in those cases in which we have involvement of the joints, or some motor affection, we may readily be led astray; and it is only after a very careful and thorough examination of the patient that the real diagnosis can be arrived at.

Treatment.—The home treatment of hysteria is not as a rule very successful. The child should, if possible, be sent to live with strangers. The diet should be abundant and nutritious, and consist largely of milk and milk foods. Above all things the child should be carefully guarded from the pressure of school life, and outdoor exercise may often with advantage be substituted for confinement in a badly ventilated schoolroom. Beyond the administration of cod-liver oil and iron as general tonics, we cannot advise the use of any particular drug as a specific in the treatment of hysteria.

HEADACHES.

Headache must, of course, be regarded purely as a symptom, but when present in a child it should never be neglected, as it is often indicative of important organic disease.

Etiology.—Many and varied are the causes which lead to the production of headache during childhood. The commonest of all causes is some gastro-intestinal condition, dyspepsia it may be, or constipation. A frequent source of headache, and one which is apt to be neglected, is the presence of dental caries. The association of headache with adenoids and enlarged tonsils is a subject deserving attention. Errors of refraction, lack of fresh air, and general malnutrition, are potent factors in the causation of this condition. Of other causes we may mention the onset of infectious fevers, the presence of middle ear disease, or of nephritis, while organic cerebral disease must not be forgotten.

Headaches may be met with at all ages, but are certainly much more common during the period of school life. Migraine is frequently found in children, and presents practically the same clinical picture as it does in adults, heredity playing a prominent part in the production of this variety of headache.

Diagnosis.—When a child is brought to us suffering from headache we are bound to inquire as to the origin of this symptom. After investigating as to the state of the gastro-intestinal tract, attention should be directed to the presence of dental caries; while the eye, nose, throat, and ear should be seen to. Kidney mischief, and the probable causation of headache by the presence of any acute febrile condition, should never be lost sight of, while

some disease of the brain or of its meninges may be found to exist.

Treatment.—This must be directed with a view to the cure or removal of the underlying condition. In most cases rest and a diet of milk and dry toast will be advantageous, while in addition small doses of bromide of soda combined with phenacetin may be administered. Regarding ocular causes of headache much has been written, and undoubtedly the prescribing of suitable glasses frequently affords relief; but too much should not be made of defective eyesight, as otherwise certain important sources of headache may be overlooked. The same remark applies to adenoids.

INSOMNIA.

Sleeplessness may be met with at any age from infancy onwards.

Etiology.—When an infant is found to be restless and sleepless during the day or night the cause is almost certain to be improper feeding. The error usually consists in feeding the infant at irregular intervals, or it may be in giving him a milk mixture which is quite unsuited to his requirements. After the period of infancy insomnia is usually the result of mental excitement. It may be brought on by allowing the child to run about just before going to bed. In other cases insomnia is found to result from giving the child too much food before retiring for the night. Some children are afraid of the dark, and this is sometimes found to be productive of insomnia. Imperfect ventilation may likewise produce it; while it may, in some cases, be an early evidence of serious organic disease.

Treatment.—The cause should be carefully investigated, and, if possible, removed. In infants proper attention should be paid to the feeding of the patient. In all cases the bedclothes should be warm, and the room thoroughly ventilated. The evening meal should be light, and the child should not be allowed to play about for at least two hours before bedtime. In nervous children a warm bath, followed by a hot drink, will often prove quite sufficient in producing sleep. It is rarely necessary to administer any form of hypnotic in these cases.

PAVOR NOCTURNUS.

This condition is sometimes known under the more familiar term of Night Terrors.

Etiology.—Pavor nocturnus is usually met with in nervous children, and is sometimes found in rheumatic subjects, or in those who have either previously or at some future time developed chorea. The condition is apt to be brought about by over-excitement during the day, and by the partaking of a heavy supper just before going to bed.

Symptoms.—The child goes to sleep, and may continue sleeping for an hour or more. Suddenly he wakes up screaming, and sits up in bed, looking wildly about him. He fancies he sees undesirable objects. He entirely fails to recognise his parents or nurse, and when spoken to refuses to attend to what is said. After remaining in this state for a varying length of time he gradually becomes more settled, and then falls off to sleep again. In the morning he has no recollection whatever of the occurrence.

Prognosis.—Although these attacks are often found

to recur with considerable frequency, ultimate recovery is almost certain to take place as the child grows older.

Treatment.—The child should retire early to rest, and should not be excited during the day, either by lessons or by games. Supper should not be a heavy meal, and should be taken at least an hour before bedtime. In bad cases it is often necessary to administer a sedative, such as sodium bromide, before the patient is put to bed.

DISORDERS OF SPEECH.

The faculty of speech is normally developed during the second year of life. If the child is unable to articulate distinctly and correctly at the age of two years the condition must be regarded as abnormal.

Etiology.—Speech may be delayed on account of some physical condition, such as the presence of cleft palate. On the other hand it may be due to the condition of deaf-mutism. Sometimes also it is found that children have contracted some serious disease just when they were learning to articulate, and the result has been the production of aphasia. By far the commonest cause, however, of delayed speech is the presence of mental deficiency.

Varieties of Speech Disorder.—Apart from the fact that speech may be delayed or retarded, we may find the variety known as *stammering*, in which the child has difficulty in getting the words out. *Lalling*, or baby speech, may continue to be the only form of articulation long after the period of infancy has been passed, and this constitutes a very serious disorder, indicating, as it usually does, the presence of some mental defect. A simple form of disordered speech is very frequently seen in children, in which special difficulty

is observed in the pronunciation of the letter "R," which is pronounced more or less like an "L." *Nasal speech* is commonly seen in children who suffer from enlargement of the tonsils. Beyond these varieties there are no others of any special importance.

Prognosis.—In the majority of cases, provided there is no mental defect, we may assure the parents that the child's speech will in time improve, and eventually become perfectly developed. Even in the case of mental defectives much may be done by careful training to develop this important faculty.

Treatment.—This is really, in the majority of cases, purely a matter of education. Children who stammer should be encouraged to sing and to read aloud slowly and distinctly. In other cases attention to the underlying condition, and due care in the training of the child are the measures most likely to be productive of satisfactory results.

MENTAL AFFECTIONS OF CHILDHOOD.

MICROCEPHALIC IDIOCY.

This is a condition in which we have arrest of development of the brain, more especially in the temporo-sphenoidal and occipital lobes. The cranium is greatly diminished in size, and is narrowed from before backwards. The anterior portion of the head slopes backwards at a very acute angle. It thus differs from the hydrocephalic head, the anterior portion of which slopes markedly forwards. Such children are usually small in stature. Speech is generally limited to a few baby syllables. These idiots are lively enough in their movements; in fact while awake they are scarcely still for an instant. What mind

they have seems to wander from object to object, without confining the attention for any length of time to any one thing. Apart from the small size of the head and body these children may otherwise be perfectly normal.

Attempts have from time to time been made to treat these cases by surgical operation, on the assumption that the non-development of the brain was due to premature ossification of the cranial sutures. Unfortunately very little, if any, benefit has been found to result.

HYDROCEPHALIC IDIOCY.

Idiocy not uncommonly results from the presence of an excess of fluid within the cranium. In these cases we find that the head has a very characteristic appearance, the anterior portion sloping forwards, and the whole head being disproportionately large. The antero-posterior and transverse diameters are, in most cases, nearly equal.

Hydrocephalic idiots often suffer from convulsive seizures, whilst sight and hearing are frequently much impaired. Strabismus is likewise common. Unlike microcephalic cases they are quiet, and little inclined to move about. Instead of being bad tempered and wilful, as microcephalic idiots often are, we find them to be, generally speaking, well behaved and easily managed.

MONGOLIAN IDIOTS.

This class of idiot has been so named from the fact that their eyes are usually placed obliquely, while the nose is broad and stumpy. The features, as a whole, are broad and somewhat flat. The antero-posterior and transverse diameters of the cranium are practically equal.

The body is stunted, and the hands broad, the fingers of which are short, while the little one is usually more or less curved inwards. The feet are also broad and considerably foreshortened. The tongue often protrudes in a characteristic fashion, and is apt to be large and roughened, while it may be found, especially in idiots of older age, to be fissured transversely. The joints of these children are frequently very lax, and it is quite a common feature in these cases to find that the child flexes the lower limb as a whole on the abdomen, and plays with it as he sits in his nurse's lap. These children are often stated to be the last of a long family, but this is by no means always the case.

Mongolian idiots are frequently affected with adenoids, affections of the eyelids, enlarged cervical glands, and various pulmonary conditions, while they are more than ordinarily liable to the common diseases of infancy and early childhood. In some respects they resemble closely in their clinical history the subjects of rachitis, as they are late in sitting up, in cutting their teeth, in walking, and in learning to speak. The skin is very often found to be dry and coarse, and the hair likewise. Tongue-sucking is an extremely common habit. Otherwise these idiots are, generally speaking, good tempered, easily amused, and easily controlled.

AMAUROTIC FAMILY IDIOCY.

This is a curious form of mental disease, of which only a few cases have been described. It is certainly far more common among Jewish children than in those of other races. These children are usually perfectly healthy at birth, and nothing of importance is noticed regarding

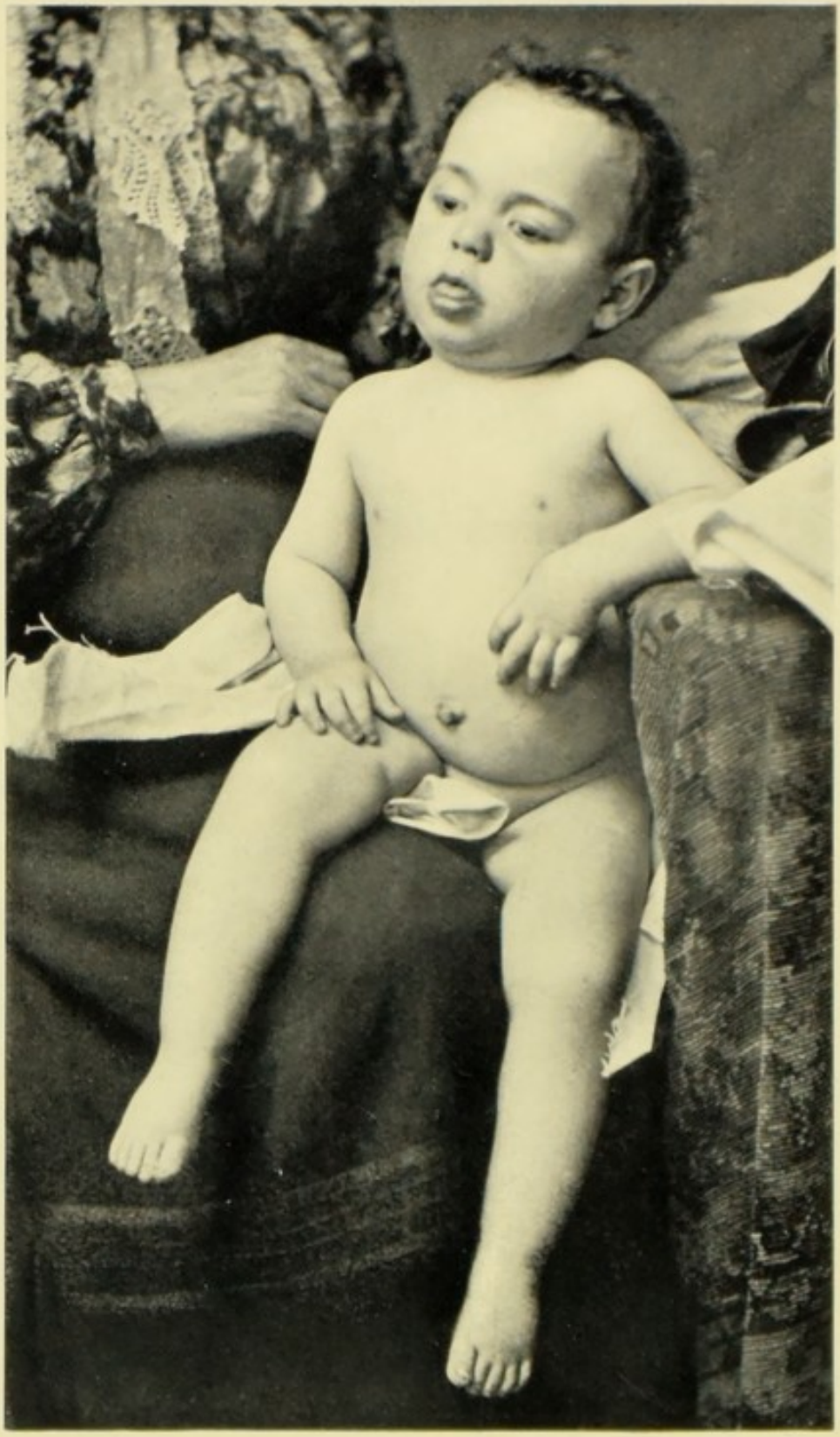


PLATE VII.—Author's case of Amaurotic Family Idiocy.

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them for perhaps the first six months or more of their existence; then symptoms develop which closely resemble those met with in rachitic children. They become soft and flabby. They are perhaps unable to sit up, while they show no attempt at walking or at speaking. On examination the limbs are often found to show alteration of the reflexes. Then it is observed that sight is affected, and on examination of the fundus it is found that there is an affection of the macular region. By and by atrophy of the optic nerves sets in, and the patient becomes totally blind. In the majority of cases these children die before attaining the age of two years. They may be cut off by some intercurrent disease, but as often as not no definite cause can be assigned for their death, as usually they seem to pine gradually away.

On the opposite page will be seen a very good example of a case of this kind which came under our notice some time ago, a short description of which was published in one of the journals.[1]

AMENTIA.

The term amentia is a very convenient one, and it may be employed to embrace the various forms of abnormal mental states which cannot be included under any other more definite heading. We have, on the one hand, a condition known as *primary amentia*, in which we have the mental defect developed at birth, and this form is by far the most commonly met with. Cases of *secondary amentia*, in which the condition has been occasioned by some definite disease-producing factor, are much rarer.

[1] *Journal of Mental Science*, Jan. 1905.

It is possible to include under this group cases which we have considered under the distinctive titles of microcephalic and Mongolian idiocy respectively, but we prefer to limit the term to conditions of a much less clearly defined description.

The one characteristic to be observed in every case of amentia is mental defectiveness in a varying measure. Thus, these children may be merely what is known as feeble-minded, or they may be hopelessly idiotic. They may be merely backward in development, mental and physical, and their education has to be carried on with considerable difficulty. They often exhibit great uncertainty of temper. They are frequently irritable, and their management is very difficult. Their development is slow, and at the best most imperfect.

Secondary amentia may come on after any serious disease, more especially, however, after cerebral affections and the exanthemata. In some cases amentia develops in connection with epilepsy, constituting a variety which is sometimes termed *epileptic idiocy*. Congenital syphilis is also occasionally found to produce amentia. The type of general paralysis, which sometimes occurs in children, is, in reality, merely a variety of *syphilitic amentia*.

On the Diagnosis of Mental Disease in Children.—As a rule the diagnosis of mental disease is not a difficult matter when once the condition has fully developed. On the other hand, however, during the period of infancy, and especially before the child has learned to walk or to articulate, it is often by no means an easy task to decide whether the patient is merely backward in his development, or affected by some form of mental disease.

Sometimes a clue to the diagnosis is given us by the presence of certain *defective developmental conditions*, such

as abnormality in the shape of the ears, the presence of well-marked epicanthic folds, abnormal conditions of the palate, peculiarities of the skin and hair, and flattening of the nose.

Sometimes the *facial expression* is significant. Sucking of the tongue, or its constant protrusion, may give a hint as to the mental condition of the patient. The *general behaviour* of the patient should also be noted. Undue restlessness, or abnormal placidity or dulness, should at once arrest the physician's attention. Then again, undue *smallness or largeness of the head*, and more especially *abnormality in the shape of the forehead*, are often of considerable importance.

When the patient has passed beyond the stage of infancy he will be found to be in many respects but a baby still. This will be noticed by his defective muscular power, as well as by his deficiency in intelligence.

In examining such children we should inquire particularly as to their ability to sit up, to stand or walk alone, and to talk. We should also inquire regarding their usual habits, as to whether they are easily amused and gentle by nature, or whether they are irritable and hard to control. Their degree of fondness for toys, animals, and other children, is also a matter to which some attention should be paid.

Treatment of Mental Disease.—The treatment of cases of mental disease practically resolves itself into a question of *education*. Their education will be more difficult than that of normal children. They must be encouraged to employ their muscles as much as possible. They should be allowed to play with whatever seems to amuse them. The power of attention must be carefully controlled, as in many cases this faculty is either imperfectly or not at all

developed. All bad habits which have been acquired must be checked as far as possible.

Attention to the *nutrition of the body* will usually be found beneficial in developing the mind; accordingly the feeding of such children should be conducted with the greatest possible care. Milk and milk-foods, together with fat in the form of cream, cod-liver oil, and virol, should enter largely into the dietary. Baths and massage are usually beneficial.

The *clothing* of the patient must also be seen to, and this should be warm and light. Finally, the child should live in the open air as much as possible.

The treatment of any intercurrent disease must be carried out on general principles, but with more than ordinary care.

Although mentally affected children usually show but little sign of improvement, even when carefully educated and managed, still, by attention to the points which we have referred to, a certain amount of benefit may, in most cases, be expected to result.

CHAPTER XV.

INFECTIOUS FEVERS.

In this chapter we shall only consider the commoner forms of Infectious Fever; and first of all we shall look at a set of four which are usually grouped together. This group comprises Measles, Rubella, Scarlet Fever, and what has been, for want of a better name, termed the Fourth Disease.

MEASLES.

Measles, we need hardly remark, is an exceedingly common disease both in infancy and childhood. Because it is of such common occurrence it has come to be regarded by the laity as a disease of very little moment. In places where its notification is not made compulsory, this tendency to consider it lightly has become more marked. So much so is this the case that the term "fever" to the lay mind means scarlatina. As a rule when one asks if a child has ever had any disease, a very common answer is either "nothing but measles," or "only measles," showing how very insignificantly this infectious fever is regarded by the general public. Measles, however, is a disease of considerable gravity on account of the serious complications which are apt to follow in its train.

Measles is one of the most infectious of all fevers, and

is most common between the ages of one and five years. It is infectious even before the initial symptoms are present, and hence its notification, which can only be made after definite indications of the disease present themselves, is rendered invalid to a certain extent. The incubation period of measles is from ten to fourteen days.

Symptoms.—The disease is ushered in by catarrhal conditions. There is always a considerable amount of sneezing and running of the nose and eyes. There is

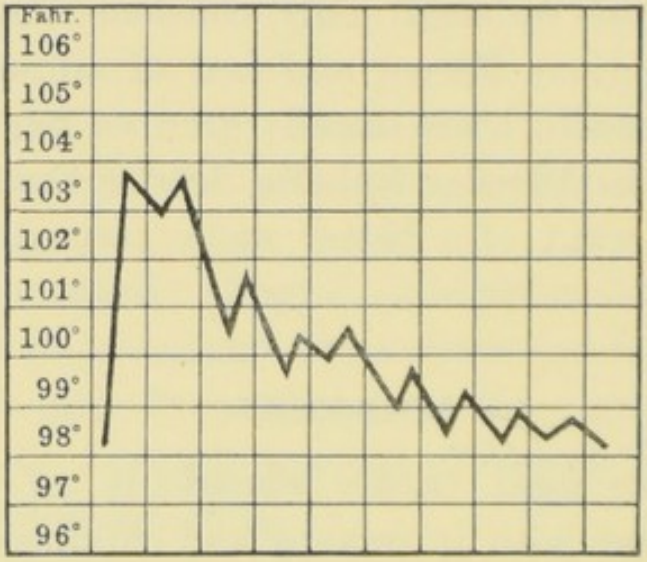


FIG. 9.—Temperature Chart in a case of Measles of ordinary severity.

also a harsh cough present, due to affection of the throat, while in some cases there may be even slight bronchitis. At the onset the temperature may vary from 100 to 102 degrees, and in severe cases it may even rise to 104. The symptoms progress, but the temperature may fall somewhat on the second day, only to rise anew. In very young children it is not infrequent to find the disease ushered in by convulsions, which are apt to mislead the uninitiated.

A good deal of attention has been directed to what are known as Koplik's spots. These are minute, bluish white

dots in the centre of a reddish area, and they are found on the mucous lining of the cheek. Some little time ago, during a severe epidemic of measles, we observed these spots in about three out of every four cases. Before the rash appears on the skin, it can usually be noticed in the form of bluish papules arranged in a somewhat crescentic form on the soft palate.

Usually on the evening of the third, or on the morning of the fourth day, the typical skin rash makes its appearance in the form of small papules. These may very often be detected earliest just behind the ears, and on the upper part of the neck; but very often they are first seen upon the face. From the face they spread downwards over the chest, abdomen, and limbs. The rash is always well marked on the face. If it is very extensive we may find considerable œdema of the affected skin, and the eyes may be entirely closed. The rash disappears within a week, and the temperature usually falls on the sixth day, or at the latest on the seventh. After the rash has faded a brown discoloration of the skin may be noticed for some time longer. As the rash disappears very fine desquamation may be observed. In ordinary cases the child is perfectly well by the end of the third week.

Complications.—These may be grouped under two general headings—(A) Major, (B) Minor.

(A) *Major.*—The most common of the graver complications of measles is *Broncho-pneumonia.* In every case of measles there is always more or less bronchitis, and this may go on to involve the capillary tubes, and eventually a broncho-pneumonia may be set up. This occurrence is recognised by the fact that the temperature rises after the rash has disappeared, and the thermometer has reached the normal. The cough becomes more

marked, and the respirations are rapid, the alæ nasi working vigorously. It must never be forgotten that all this time there may be very few physical signs in the chest. In fact, if one were to rely for the diagnosis of broncho-pneumonia upon physical signs alone, many cases would undoubtedly remain undiagnosed. It may be that several days elapse before the stethoscope reveals the presence of this disease.

The other grave complication to which we would refer is *Tuberculosis.* In the majority of cases this takes the form of a tuberculous broncho-pneumonia, which is characterised by the presence of a hectic temperature, although this feature may not be observed during the period of infancy. Although the lung is the organ most commonly affected by tubercle, the joints and glands are not infrequently involved, while not a few cases of abdominal tuberculosis are met with after an attack of measles.

(B) *Minor.—Catarrhal laryngitis* and *tracheitis* are very frequently met with in connection with measles. In consequence of throat affection the *tonsils may become enlarged,* and the *glands of the neck are frequently involved,* though these do not necessarily become tuberculous.

Otitis media is a complication which should be borne in mind. In these cases the temperature rises without any definite cause, and there may be no pain whatever in the ear. As a rule the membranum tympani becomes ruptured, the retained pus escapes, and the temperature at once falls. *Conjunctivitis, keratitis,* and *iritis* are all frequently met with in connection with this disease.

Transient albuminuria sometimes occurs, while *diarrhœa,* and often *enteritis,* may be met with, either during the onset of the fever or at a later period in its course.

The latter sometimes constitutes a complication which leads to considerable difficulty in treatment.

Gangrenous stomatitis may occur as a complication of measles, but it is fortunately extremely rare. We may also mention *pleurisy* and *empyema*, while *vulvo-vaginitis* must not be forgotten.

Prognosis.—Generally speaking, measles, when properly treated and carefully nursed, is not a serious affection. There are five unfavourable symptoms which it is well to bear in mind. These are: (1) a high temperature at the start, (2) a continuously rapid and feeble pulse, (3) severe diarrhœa, (4) repeated convulsions, and (5) the presence of one of the major complications.

Diagnosis.—Measles may be diagnosed from *scarlet fever* by the facts that in the latter disease we have vomiting and more or less tonsillitis at the outset, while there is no coryza or lachrymation as in measles. Then there are the rapid pulse and the strawberry tongue, so characteristic of scarlet fever. Again, the rash appears within twenty-four hours in the latter disease, whereas, in measles, it does not come out until the third or fourth day.

During epidemics of *smallpox* it is possible for errors in diagnosis to arise; but if we remember the initial rigors, and the awful pain in the back and head which are present in smallpox, together with the fall of temperature on the third day when the rash comes out, there will not be much danger of making mistakes.

Rubella may present a difficulty, but in this disease there are no catarrhal prodromata, the rash being the first actual evidence of the fever.

Treatment.—The first thing to do in every case of measles is to isolate the patient in a sick-room which is

large and airy. The room should be darkened, and the patient should wear a shade over the eyes. The temperature should be kept fairly constant on account of the catarrhal symptoms. In every case the first step in the actual treatment is to rub the chest well with warm olive oil, and to put on a cotton-wool protector.

The diet should be a milk one; but as children, like older patients, rapidly tire of milk, it is well to vary this with beef jelly, broths, and such like. A good mixture, in most cases, consists of the following:—

℞ Liq. Ammon. Acet.	℥i.
Tr. Camph. Co. (this should be omitted in the case of infants)	℥ii.
Syr. Tolu.	℥ss.
Aq. Dest. ad	℥iii.

Sig.—A tea-spoonful in water every three or four hours.

During the course of the disease plenty of water should be given to drink, as this favours the determination of the rash to the skin, and, at the same time, will favour elimination by the kidneys. In most cases the eyes require to be attended to. They should be bathed frequently with lotio acidi borici, and a little ung. hydrarg. oxid. flav. applied to the lids. Diarrhœa usually calls for no treatment beyond strict attention to the diet, unless, of course, it becomes very severe, in which case it must be treated on general principles. Other complications have to be considered as they arise. In every case the practitioner must keep his eye and ear upon the chest, as it is only by great vigilance that the onset of respiratory complications can be observed. The patient must be kept in bed for at least a fortnight, even in mild cases.

The question is often asked, Should measles be notified? Many authorities say "No," because it is infectious for some time before it can be definitely recognised, and therefore

notified as measles. Personally, however, we say "Yes," because, as we have already remarked, the laity are apt to think very lightly of the disease, and also because its complications are more than ordinarily dangerous.

RUBELLA, ROTHELN, OR GERMAN MEASLES.

We approach the consideration of this disease with considerable diffidence, because there can be no doubt whatever that the term "German Measles" is not infrequently adopted when a difficulty of diagnosis presents itself. Still it must be admitted that there are cases in which we have a distinct and definite disease, which is neither modified measles nor yet modified scarlet fever. This particular disease is to be termed Rubella.

Symptoms.—It is very infectious, shows little or no prodromal symptoms, and has an incubation period which has been variously stated by different observers, but which in the majority of cases is practically the same as that of measles. At the outset the temperature is usually somewhat raised, and there is often a considerable degree of sore throat. The rash assumes a papular form, and this is usually the first sign of the fever. Swelling of the glands in the neck is not uncommon, and nasal catarrh is frequently present. The rash is often slight in extent, and is never of long duration, and in the majority of cases the rash has faded and the temperature become normal within two, or at most three days from the onset of the illness. Desquamation is frequently seen, resembling more or less closely that of measles.

Complications.—Complications are practically unknown, and beyond involvement of cervical glands there is probably no complication which is at all noteworthy in character.

Diagnosis.—Great care should be taken to avoid using the term rubella when the case is really a mild one, either of scarlet fever or of measles. There is no vomiting as a rule, and the rash on the face does not occur in the form of a definite flush as it does in scarlet fever. Tenderness of the posterior group of cervical glands is often a marked diagnostic feature of rubella. It is more difficult to distinguish this disease from a mild case of measles. All we can say is that catarrhal symptoms are certainly much less marked in rubella than they are in measles, while the rash in the latter case is always more definitely marked upon the face than it is in German measles.

Treatment.—The patient should be kept in bed and isolated exactly as if the case were one of measles. He should be kept on a milk diet, and given a febrifuge at regular intervals. In other respects the treatment resembles that of a mild case of measles.

SCARLET FEVER, SCARLATINA.

This is in some respects the most important of the group of Infectious Fevers which we are at present considering. Cases of this disease differ very markedly one from another in regard to their severity, and also in regard to the conditions which are actually present. In Britain scarlet fever is most commonly met with during the last quarter of the year, although cases may occur during any of the other months. It generally occurs in epidemics. The most frequent source of infection is direct contact either with a patient, or with something which has been used by him during his illness. Until recently, the view held by most authorities was that the

desquamating period is the most infectious, and that the micro-organism of the disease is present in the scales which are shed. More recent investigations, however, go to prove that infection is at all events more likely to occur from the secretions of the patient. The whole subject, however, of the infectivity of scarlet fever is one on which fresh light will probably be thrown at no very distant date.

The value of notification and of hospital treatment of this disease has recently been discussed by some of our leading sanitary authorities. The tendency seems to be to regard the hospital treatment of these cases as of little consequence in reducing the death-rate, although it is well known that the number of cases dying from scarlet fever has been enormously reduced during the last decade.

The period of incubation is usually three days, but patients may be attacked within twenty-four or forty-eight hours after their contact with infection.

Symptoms.—For all practical purposes we may consider scarlet fever as occurring in three distinct forms:—

1. Scarlatina Benigna.—This is by far the most common form in which the disease presents itself in actual practice. The onset is usually sudden. The child complains of sore throat and of sickness, and actual vomiting may be present. There is often considerable headache and fever, frequently accompanied by dull aching pains in the limbs. A tripod of symptoms, namely, sore throat, vomiting, and headache, is very characteristic of the initial stage of this disease. In addition we find that the pulse is always rapid, and that the temperature is high. The temperature may vary widely from 103° to 106°, while the pulse may be 140 to 160. In very young children the disease is often ushered

in by convulsions. The throat when examined shows as a rule considerable redness, while the tonsils may be enlarged and somewhat congested.

The rash usually appears within twenty-four hours. It is first seen on the chest, the neck, and the arms. The rash appears as a general redness, and rapidly extends to the other parts of the body, and eventually implicates the face. The child's skin becomes intensely reddened. The tongue now begins to assume its characteristic appear-

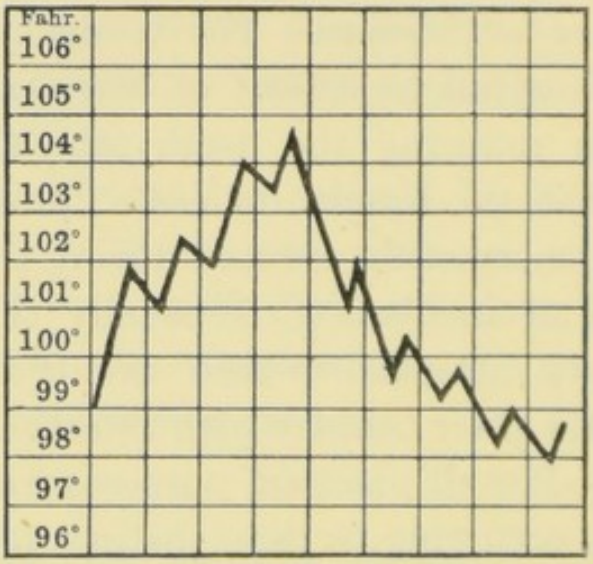


FIG. 10.—Temperature Chart in a mild case of Scarlet Fever.

ance. It is red and the papillæ stand out in bold relief, constituting what is known as the strawberry tongue.

Delirium is not at all uncommon, and very frequently we find that there is considerable swelling of the cervical glands. On the fourth or fifth day the disease reaches its crisis, and then the temperature usually begins to fall very gradually until it reaches the normal about the twelfth day of the disease. On the seventh day desquamation usually begins. It takes place first on the chest, and last of all upon the hands and feet. The scales are at first very minute, but eventually they become very much

larger. Desquamation is usually complete in a fortnight, but it may continue for three or four weeks.

2. Scarlatina Maligna. — These cases are unusually severe. The rash always shows a tendency to become hæmorrhagic. The pulse is very rapid and the temperature rises in proportion to the pulse. Vomiting is often uncontrollable, and eventually the child becomes delirious, subsultus tendinum being commonly seen. Such cases almost invariably prove fatal.

3. Scarlatina Anginosa. — In this form the throat presents characteristic features. The tonsils are usually greatly swollen and ulcerated, while the cervical glands are very much enlarged. Albuminuria is frequently met with, and the patient becomes greatly prostrated. Death is common about the end of the second week, but some cases maintain their vitality for a considerable period, until eventually the disease assumes more of a toxic nature, and we find evidence of septicæmia present.

Complications.—The complications of scarlet fever are very important. The most common is certainly *otitis media* which, if not properly treated, may eventually lead to cerebral implications. *Albuminuria* is also frequently met with, and it is often present in the milder cases of this disease. Albuminuria, in fact, is sometimes the only symptom which leads us to a diagnosis of scarlet fever, as in many cases in which it occurs the rash has been but slight, and may have been passed over unobserved. When albuminuria is present we may have it associated with œdema of the face and lower limbs.

Of other complications we would mention *arthritis*, which is very apt to be mistaken for rheumatism. In fact cardiac complications are by no means uncommon in connection with scarlatinal arthritis. Occasionally we

have purulent effusion into the joints, which of course constitutes a very grave complication. *Enlargement of the cervical glands* is fairly common, and is more likely to occur during the period of convalescence. *Enlargement of the tonsils* is frequently met with, and may remain permanent. Other complications need only be mentioned. They are: pericarditis and endocarditis, pleurisy with effusion, and anæmia, which may persist for a considerable period.

Prognosis.—Generally speaking the younger the child the graver the prognosis. Grave symptoms are: (1) severe throat affection, (2) persistently high temperature, (3) very rapid pulse, (4) constant vomiting, and (5) delirium.

Diagnosis.—The diagnosis of scarlet fever from measles and rubella has been already considered. The distinguishing characteristics between this disease and some forms of erythema have also been referred to elsewhere (*vide* Chapter XVI.)

Treatment.—Strict isolation should be enforced, and the room chosen should if possible be at the top of the house. The throat must in all cases be painted or sprayed with some antiseptic. The diet is of great importance, and should consist chiefly of milk and milk puddings; but for older children a little thin bread and butter may be allowed, while later on fish and chicken soup may be given. It is well, however, not to allow butcher's meat or eggs for some time after the temperature has become normal.

During the period of desquamation the skin should be sponged over daily with weak carbolic lotion, and when the patient is able to be up he should be given a warm bath every morning. In all cases he should remain in bed for three weeks from the appearance of the symptoms,

and he should keep the house for two or three weeks longer.

In the treatment of scarlet fever the two great risks that have to be kept in view are, firstly, kidney complications; and, secondly, middle ear disease. For this reason the throat and the diet require special attention.

With regard to the use of drugs in the treatment of scarlet fever very little need be said. Liq. ammon. acet. is usually prescribed, and when albuminuria makes its appearance a few drops of tinct. ferr. perchlor. may be added with advantage. In joint affections salicylates usually prove effectual. When middle ear disease shows itself, as it usually does by the presence of otorrhœa, the ear must be syringed frequently with warm boracic lotion, and then carefully dried with cotton wool. Very frequently in these cases considerable advantage is gained by treating the nose and pharynx at the same time.

Mild cases often prove troublesome, as it is in such patients that complications frequently supervene. The medical attendant should, therefore, be careful how he speaks regarding any case of scarlet fever, and should always insist on the patient being treated with the greatest possible attention until absolutely convalescent.

THE FOURTH DISEASE, SCARLATELLA.

This is an infectious disease which is quite distinct from rubella and measles on the one hand, and from scarlatina on the other. It was first described some four years ago, and up to the present time no distinguishing name has been given to it beyond that of The Fourth Disease. For want of a better name we have ventured to apply the term "Scarlatella" to it. This fever occurs in

small epidemics, which usually break out during the spring months. It appears to have an incubation period of from one to three weeks.

Symptoms.—The rash is usually the first evidence of the presence of this disease, but in some cases there may be slight preindisposition accompanied by headache and anorexia. The rash is bright red and diffuse in character. It spreads very rapidly so as to involve the whole of the patient's body.

In many cases the temperature is practically normal, and, generally speaking, we may say that it never assumes a high level. When the temperature tends to be high the pulse becomes rapid, and *vice versa*. The tongue has not the characteristic appearance seen in scarlet fever, though it may be slightly furred. There is often some slight pharyngitis, and at times a mild attack of tonsillitis. Occasionally there has been observed some swelling of the posterior cervical glands.

Desquamation occurs early, and is usually in the form of small scales. There is certainly never any actual peeling of the skin such as is observed in scarlet fever. At the end of a fortnight the patient is perfectly well and able to go about again.

Complications.—The only important complication that has been noted is enlargement of the submaxillary glands. In a few cases albuminuria is present, but never to any marked extent.

Treatment.—No special treatment of scarlatella is necessary. The patient should be kept warm in bed for about a week. It is advisable, perhaps, to keep him on light diet and to give him mild febrifuges. In the majority of cases the patient is able to return to school within three weeks from the onset of the disease.

VARICELLA, CHICKEN-POX.

Chicken-pox is an infectious disease, which, however, usually runs a very mild course. It is most commonly observed between the ages of two and seven. The period of incubation varies from ten days to as long as three weeks.

Symptoms.—Vomiting, accompanied by high temperature, is sometimes observed at the outset of the disease, more especially in infants. As a rule, however, the rash is the first evidence of the disease. At first the rash makes its appearance as reddish spots upon the skin, which presently become papular and slightly raised. These papules very rapidly become vesicular in character, and it is this vesicular stage which forms the typical skin lesion of chicken-pox. Within two days, as a rule, the vesicles dry up and crusts form in their place. Fresh ones, however, keep constantly coming out, so that we may find the disease in the papular stage in one place, in the vesicular in another, and in the stage of encrustation in quite another part of the body. In not a few instances the vesicles become pustular in character, and when they dry up and the crusts have fallen off a certain amount of umbilicated scarring remains. The rash often makes its appearance first upon the wrists, but as a general rule the scalp is the first seat of involvement. The palate, pharynx, and inside of the cheeks, when examined, often present distinct vesicles. On the other hand the palms of the hands and soles of the feet are very rarely attacked.

As each fresh crop of vesicles develops the temperature rises afresh. As a rule the temperature in chicken-pox varies between 100 to 103 degrees. The tongue is often furred, and the pulse sometimes shows a tendency to be

rapid. Generally speaking, however, there is very little constitutional disturbance connected with this fever, and in the majority of cases all signs of the disease have disappeared within ten days or less. The patient, however, should be considered infectious until all the crusts have fallen off.

Diagnosis.— The diagnosis of chicken-pox is rarely difficult, but during epidemics of smallpox some confusion may arise. Cases of smallpox which have been modified by vaccination are often very difficult to distinguish from varicella. For the differential diagnosis, however, the reader is referred to the standard works on general medicine.

Prognosis.—Chicken-pox, although a common disease, is usually an exceedingly mild one, and is almost never fatal. It may, however, be followed by complications. One of the most common of these is certainly impetigo contagiosa. Anæmia is also worthy of mention, and it seems to develop most frequently in those cases of chicken-pox that have been allowed to run about during the height of the disease. Broncho-pneumonia is sometimes met with during convalescence, and cases of nephritis have been observed by more than one authority.

Treatment.—It is always advisable to keep the patient warm in bed. If the temperature is high febrifuges should be administered, and a milk diet is always desirable. A very important part of the treatment consists in preventing the patient from scratching the skin, especially during the crusting stage, as, if the scabs are prematurely picked off, permanent pitting may result. To allay the itching the skin may be dusted over with a powder consisting of zinc oxide, bismuth, and starch, while if preferred

calamine lotion may be painted on with a brush. This lotion has the following composition :—

℞ Calaminæ	℥iv.
Zinci Oxidi	℥ii.
Aq. Calcis	℥iii.
Glycerini	℥ii.
Aq. ad	℥vi.

MUMPS, INFECTIOUS PAROTITIS.

This disease, which is characterised by inflammation of the salivary glands, is highly infectious. It is most commonly met with during the spring and winter months, and has a very variable incubation period, which is usually stated as being between two and three weeks.

Symptoms.—The child is usually unwell for some days, not caring for his food, and inclined to be restless and irritable. Then he becomes feverish and complains of a distinct soreness on swallowing. After the lapse of some hours distinct swelling of the parotid gland may be observed, and the act of deglutition becomes very difficult and painful, while the gland is exceedingly tender to the touch. Within two or three days the corresponding gland on the opposite side becomes affected, and when this occurs the outline of the child's face becomes quite obscured, so that it presents a most remarkable and characteristic appearance. The temperature is usually found to be about 103°, but soon becomes normal, only to rise anew when the opposite parotid gland becomes involved.

Not uncommonly we meet with swelling of the submaxillary glands alone, the parotid not being affected; this constitutes what has been termed Submaxillary Mumps, and this condition is perhaps more frequently met with than is generally supposed.

Diagnosis.—The fact that both parotid glands are affected usually renders the diagnosis perfectly plain and clear. Suppuration never occurs in the course of mumps, and this fact distinguishes it from other glandular conditions. If the throat be examined very little can be seen, and this serves to diagnose mumps from diphtheria.

Prognosis.—Speaking generally, we may say that the prognosis of mumps is favourable. There are, however, some complications which it is well to keep in view. Of these deafness, associated with otitis interna or media, is one of the chief. Of the others we would only mention orchitis and affections of the brain, the latter, however, only occurring in the worst cases.

Treatment.—The patient must be isolated, and, as a general rule, it is well to keep him warm in bed. Locally lead and opium fomentations may be applied to the swollen glands. The diet should be mainly fluid, and should therefore principally consist of milk, broths, and beef jellies. A febrifuge may usually be given with advantage, but there is no drug which will actually modify the course of the disease. The patient should be kept in bed for a week or ten days, and when he is allowed to go about he should be warmly clad and protected from chills.

PERTUSSIS, WHOOPING-COUGH.

This is a highly infectious and very dangerous disease. In spite of this, pertussis, like measles, is usually regarded by the laity as a condition of little importance. Epidemics are frequent during the winter and spring. It is one of the diseases which occurs with great frequency during the first year of life, and it certainly becomes less common after the age of ten. There exists a very close relationship

between measles and whooping-cough, so that one often gets a history of succeeding attacks of one or other of these diseases in the same child.

Whooping-cough seems to be more common in rachitic children than in others, and it certainly proves more often fatal in such cases. It is not infrequently followed by tuberculous disease.

Symptoms.—Whooping-cough for purposes of description may be conveniently divided into three stages:—(1) Catarrhal, (2) Paroxysmal, (3) Terminal.

1. **The Catarrhal Stage.**—The child is evidently ill, and presents the usual symptoms of a common cold, or it may be slight bronchitis. The temperature is generally raised. On examination it is usually difficult to determine what is really the cause of the child's symptoms at this period of the disease. There is always more or less cough present which may quite well be accounted for by the slight bronchitic signs in the chest. On the other hand, when the throat is examined the pharynx and tonsils may appear somewhat red and congested, so that a diagnosis of tonsillitis is often provisionally made. This stage usually lasts from two to three weeks.

2. **The Paroxysmal Stage.**—The cough continues and becomes more marked. It comes on in paroxysms in which we have a series of short coughs, followed by a long inspiration or whoop, at the end of which the child usually vomits. During the attack the patient clings to its parent or to a chair for support. The face becomes quite congested and the eyes somewhat puffy-looking. The child often brings up a considerable quantity of thick mucus. These paroxysms may occur four or five times a day, and epistaxis or subconjunctival hæmorrhages are fairly frequent. On examination of the chest we usually find

harsh vesicular breathing accompanied by rhonchi and moist sounds. The cough is invariably worst at night. This stage lasts for a varying period, which may be a month or considerably longer.

3. **The Terminal Stage.**—In this stage the paroxysms gradually become fewer and fewer until they cease altogether. The cough, however, may continue for a very long time. In fact, there are many cases in which the cough is persistent simply from the effect of habit. Still, when we have a patient brought to us complaining of a cough which has lasted for some months after the attack of whooping-cough has completely passed off, we should be very suspicious lest pulmonary mischief of a tuberculous nature is present.

Complications.—Two of the principal complications of pertussis are bronchitis and broncho-pneumonia, the latter being a not uncommon cause of death, more especially in rachitic children. Tuberculosis is also, unfortunately, a fairly frequent complication. It usually assumes the form of a tuberculous broncho-pneumonia. In such cases the child will be brought to us, either because he is "dwining" or has a cough. Subconjunctival hæmorrhages and epistaxis are frequently seen, and cases of meningeal hæmorrhage are also met with. One of our own cases, occurring in an infant, developed broncho-pneumonia, and a fatal termination was ushered in by well-marked tetany.

Diagnosis.—The diagnosis of whooping-cough is always a matter of considerable difficulty, unless the child presents the symptoms of the typical paroxysmal stage, or has a definite history of infection. The points to rely on most are the presence of a cough which is worst at night, the association of vomiting, puffiness of the eyes, and an ulcer on the frenum linguæ. It must be remembered, however,

that a history of cough which is worst at night is frequently got in cases of enlarged tonsils and adenoids, only such cases seldom present vomiting as a symptom, but show other symptoms such as snoring at night, difficulty in nasal breathing, and frequently have a characteristic facies.

Prognosis.—Whooping-cough is undoubtedly a dangerous disease, and if neglected is very liable to prove fatal. The presence of rachitis or of tuberculosis always makes the prognosis much graver. Apart from these there are the dangers of bronchitis with emphysema being set up, and of broncho-pneumonia which is a fairly frequent complication.

Treatment.—All cases of whooping-cough should be isolated. In the treatment of the patient two rooms are necessary, as fresh air is most essential. While one room is occupied by the patient, the other should be aired. If no chest condition is present the child may be allowed to get up and to be out of doors when the weather is fine. On no account must he be allowed to mix with other children. Plenty of good nourishing food must be given, and if there is much vomiting the child should be fed immediately after a paroxysm.

Various specifics have been recommended for the treatment of whooping-cough. None, however, is really of universal service, except euquinine. It is certainly a very valuable drug, and although it cannot be said to do good in every case it is well worth a trial. In most cases a mixture of belladonna and bromide of soda is administered, some such prescription as the following being very suitable:—

℞ Sod. Brom.	grs. xviii.
Tr. Belladonn.	℥i.
Glycerini	℥ii.
Aq. Dest. ad	℥iss.

Sig.—A tea-spoonful in water every three or four hours.

Should any chest condition be present, such as bronchitis or broncho-pneumonia, it must be treated on general principles. During convalescence, which is apt to be somewhat retarded, a change to the sea-coast or to dry mountain air is to be recommended.

Great care must be taken of the child for several months after the attack of whooping-cough has passed off, more especially if there is a tendency to tuberculosis. The chest should be examined at frequent intervals, any existing cough being noted, and if possible alleviated.

DIPHTHERIA.

This is a very infectious fever, and it is one of the few in which the cause has actually been determined. The specific organism is the Klebs-Löffler bacillus, which was first distinguished in 1883. The organisms produce the membranes; the toxins which they generate cause the constitutional disturbance.

The great source of infection is to be found in our day schools, while milk may also act as a carrier of the germs. Sewer gas is to some extent to be looked upon as an etiological factor, but dampness is probably a much more potent cause. Secretions from the nose and throat in diphtheria are highly infectious, and it is by means of these that the infection may be spread from a sick person to others. Children with adenoids, or enlarged tonsils, or those who have any defects in the mucous membrane of either throat or nose, are much more liable to be attacked by diphtheria. It is also very commonly met with after scarlet fever and measles. The age of incidence is from two to five years as a rule, and it is much less commonly seen after the age of ten. The incubation period is from one to five days.

Symptoms.—The patient appears to be acutely ill. Sometimes the attack is ushered in by vomiting, or it may be by convulsions. The child complains of sore throat, goes off his food, and may have attacks of shivering. The temperature is found to be raised. On examining the throat a simple tonsillitis is usually all that can be made out, but within 24 or 48 hours the typical membrane makes its appearance. It is greyish white in colour, and is not easily separated from the underlying mucous membrane. It forms first upon the tonsils, then upon the uvula, then upon the soft palate. The pharynx may be completely covered over. The cervical glands are more or less swollen. The temperature as a rule is never very high, a very common average being from 100 to 102 degrees. The pulse is not particularly rapid, but it shows a marked tendency to weakness. Occasionally we meet with slight rashes on the chest, arms, and sometimes on other parts of the body. It is well to remember, perhaps, that even in a very bad case the temperature may be quite normal, Should it be found to be subnormal we can almost certainly predict a fatal termination. Albuminuria is frequently present.

If the case is mild and treated with due promptness and care, the patient's symptoms will decline within a few days. If, however, the case is a bad one, or is left untreated, we find a purulent nasal discharge present, and very frequently the membrane extends to the larynx, when we get characteristic croupy breathing associated with marked pallor. The child in such cases presents the picture of extreme dyspnœa, his respirations being rapid, his pulse feeble and it may be irregular, while beads of cold sweat stand upon the forehead.

It sometimes happens that the throat affection is ex-

tremely mild though there may be considerable nasal discharge. The disease, however, is quickly arrested, and the child in such cases is often thought to have been suffering from a simple nasal catarrh and ordinary sore throat. These are the cases in which we are most apt to find secondary conditions supervening, such as neuritis and cardiac affections.

Complications.—The complications of diphtheria are both varied and important. Albuminuria to a greater or less extent is almost always present. Broncho-pneumonia is occasionally met with, while affections of the throat and otitis media are very common. The most important complication is that of paralysis, which may involve either the heart or the peripheral nerves. Cardiac paralysis is met with in two stages in the disease. It may come on about the end of the second week, and its recognition is readily made by the presence of a feeble and irregular pulse. It is the late form of cardiac paralysis, however, which is of special interest. This form may come on at any time during the period of convalescence. It is apt to assume the nature of sudden dilatation. The child becomes rapidly dyspnœic, the pulse falters and eventually fails altogether, the child very often in these cases dying quite suddenly. Peripheral neuritis usually comes on during the third or fourth week of the disease, although it may not make its appearance for two months. When the palate is affected the patient's voice assumes a nasal tone, and food is regurgitated through the nose.

Ocular paralysis is recognised by the presence of diplopia, slight ptosis, and the patient's inability to read. The lower limbs are not infrequently affected, and in such cases the knee-jerks will be found absent, while the patient will complain of numbness and muscular weakness.

The usual electrical changes can also be demonstrated. Paralyses of the arms and of the muscles of the neck and trunk do occur, but they are much rarer.

Diagnosis.—The diagnosis, as a rule, presents but little difficulty. We have usually to distinguish between a simple tonsillitis and a diphtheritic throat affection. The diagnosis, however, can only be made with absolute certainty by taking a swab from the affected parts. It should always be taken from the under surface and sides, and not from the upper surface of the membrane.

Prognosis.—At the present time the result of any case of diphtheria depends to a large extent upon the early use of antitoxic serum. As a rule, the younger the child the graver the prognosis. The extent of the disease in some degree also influences the ultimate issue. Laryngeal diphtheria must always be looked upon with considerable uncertainty. There is one complication which considerably modifies the prognosis, and that is heart failure. We have already referred to this complication, but we may do so again in a slightly different form. There are really two varieties of heart failure met with in diphtheria. There is first the slow and progressive form in which the circulation gradually becomes feebler and feebler, the patient's pulse tends to be irregular, the temperature becomes subnormal, and the child shows more and more restlessness. He gradually falls into a collapsed state, and unless prompt remedial measures are taken eventually dies. Then there is the sudden form of heart failure in which very often the child, without any previous warning, becomes dyspnœic and succumbs without time being allowed to do anything for him.

Treatment.—In the treatment of diphtheria sunlight and fresh air should never be neglected. As soon as the

case is diagnosed antitoxic serum should be administered. Two thousand units should be given at the first injection, and this dose should be repeated within 12 to 24 hours if necessary, that is to say, if the local throat condition, as well as the general condition of the patient, do not improve. These injections should be given at once, and we need hardly mention that rigid antiseptic precautions must be adopted in giving them. The syringe, the needle, the patient's skin, and the physician's own hands must be thoroughly sterilised. The injection is best made into the skin of the abdomen, and the site of the injection should be covered over with wool and collodion. It is not unusual to find pretty extensive rashes and a slight rise of temperature after antitoxic serum has been administered; these, however, are of little consequence.

Local applications to the throat are usually advantageous, but these, of course, hold quite a secondary position to the use of antitoxic serum. Glycerinum acidi carbolici is a favourite local application, but alkaline sprays may be substituted. Cardiac and other tonics are often necessary, while the feeding of the patient is a matter of much importance. Should these measures fail, then either intubation or tracheotomy must be performed; of these two the former is much to be preferred. *The indications for intubation* are three in number: (1) when the local condition tends to get worse in spite of the use of antiseptic serum; (2) when the general condition of the patient does not improve, but instead progressive weakness is displayed, and; (3) when we have evidences of extreme dyspnœa, such as marked indrawing of the interspaces during respiration.

The *method of performing intubation* is one demanding

considerable skill on the part of the operator. The child should be enveloped in a blanket, and should lie on the nurse's left arm. His head should be kept steady by an assistant. A gag is placed in the mouth on the left side. The operator inserts his left forefinger into the mouth, and lays hold of the epiglottis. The tube is introduced alongside the forefinger, and whenever the epiglottis is reached the instrument is tilted straight upwards and then pushed down into the trachea. The operator's finger should be firmly held on the top of the tube so as to keep it in position, while the obturator is being withdrawn. Before introducing the tube it is well to see that the obturator is neither too loosely nor yet too tightly fixed in the tube. After the latter has been placed in position it can be secured by means of strings or tapes, which are brought over the back of the ears and fastened by strips of plaster. When it is necessary to withdraw the tube various methods may be adopted. We may do so by drawing upon the strings which are attached to the tube, or we may push the tube up by pressing with the fingers upon the front of the neck over the trachea. Failing these methods a special instrument may be employed, and in this case the left forefinger should be introduced into the child's mouth and carried backward until the top of the tube is reached. The instrument is then passed along the forefinger, closed, and introduced into the opening in the tube. It is then opened up and the tube withdrawn.

When all other methods fail tracheotomy must be resorted to. For a description of this purely surgical procedure we must refer the reader to any good text-book on surgery.

INFLUENZA.

Influenza is a very infectious fever, and one which may attack the youngest child. It is most commonly met with during epidemics, but sporadic cases occur every now and again. The incubation period is generally stated to be from three to six days.

Symptoms.—In many cases the onset is quite sudden and acute. The patient complains of pains in the head, back, and limbs, while not uncommonly there are vomiting and convulsions. There is always a marked degree of restlessness present in these cases. In others we have a catarrhal condition of the nose and eyes with considerable cough; while a third class of case presents more marked evidences of gastro-intestinal disturbance, diarrhœa forming a leading symptom. In all cases, no matter what the initial symptoms may be, we find evidences of extreme prostration, marked restlessness, and a weak heart, with feeble pulse and a tendency to syncope. Convalescence after influenza in children is apt to be considerably protracted.

Complications.—In a few cases we meet with various forms of skin eruptions, the most common being a diffuse erythema. Lobular pneumonia is the complication which is most to be dreaded. Lobar pneumonia does occur, but is much less common. In not a few cases the disease assumes the form of a meningeal or typhoidal affection.

Diagnosis.—The diagnosis of influenza is exceedingly difficult and uncertain at the best. During epidemics, and when we have a history of direct infection, it may become a comparatively simple matter, but sporadic cases must often remain undiagnosed. Pneumonia, enteric fever, malaria, and meningitis have all, to some extent at least, a resemblance to influenza in one or other of its

varied forms. The diagnosis must depend upon the presence of five factors:—(1) temperature, (2) listlessness, (3) restlessness, (4) extreme weakness of the body generally and of the pulse in particular, and, (5) the history of direct infection.

Prognosis.—Influenza in children is usually a mild affection. It may, however, assume a severe form. Great heart weakness or the presence of influenzal pneumonia always render the condition of the patient serious.

Treatment.—Every influenzal patient should be isolated, and all secretions from the nose and throat disinfected. Stimulation is necessary even in the mildest case, and drugs which depress the heart must on no account be administered. If pain is present it may be relieved by giving small doses of phenacetin combined with aspirin. The nose and throat should be treated by means of antiseptics. Complications must be guarded against, and when they arise they must be managed in the usual way. Great care must be taken of the patient during convalescence, when tonics and change of air will do more to effect a rapid return to health than any other measure.

MALARIA.

This is a somewhat large subject, and we can, therefore, only find space to consider the leading differences which this disease presents in its attacks upon children as compared with adults.

Symptoms.—These present greater variation in children than in adults. Convulsions, vomiting, and it may be delirium take the place of the classical initial chills met with in the adult. Vomiting and diarrhœa are fairly common at the outset. The child often complains of

feeling tired. The hands and feet become cold and the temperature rises. Within two hours the temperature falls and the body heat is restored. Later still the skin becomes hot and dry, the pulse becomes more rapid, and the face is congested. Finally, within a period of two to three hours profuse perspiration occurs, the temperature falls once more to normal, and the child drops off into a peaceful slumber.

Complications.—Under this heading we shall name conditions which are more frequently met with in the child than in the adult, and although we have termed them complications they are in some respects ordinary symptoms of malaria.

We would note particularly the fact that gastro-intestinal conditions are extremely common in the child, while bronchial and pulmonary affections are often met with. Irritability of the skin is also frequently noticed, while in children who suffer from malarial attacks, frontal headaches, neuralgias of all descriptions, and even neuritis may be met with. The spleen and even the liver are frequently found to be enlarged, while the latter often presents a considerable degree of tenderness on palpation. Finally, a greater or less degree of anæmia is always present.

Diagnosis.—The diagnosis of malaria, like that of influenza, presents considerable difficulty. In every case the blood should be examined during a paroxysm for the plasmodium malariæ. It should also be borne in mind that there is no leucocytosis in malaria, which we get in conditions due to septic infections. The effect of the administration of quinine may also be found very helpful in arriving at a correct diagnosis.

Prognosis.—The prognosis of malaria in children is on

the whole good. It is a disease, however, which is very apt to recur.

Treatment.—The child should be removed, if possible, from the malarious district. Otherwise euquinine should be given shortly before the expected paroxysms. It is well tolerated by children, and one grain may be given for every year of age. It may be given in milk, or in syrup, but on no account must it be administered in tablet form. Where difficulty arises regarding its administration it may be given in the form of suppositories. A dose should be given three or four times a day, and one of these should be administered at least four hours before the paroxysm is due. The complications will require special treatment, and where anæmia is marked the administration of iron and arsenic is indicated.

TYPHOID OR ENTERIC FEVER.

This disease differs very markedly in its manifestations and course, when it occurs during childhood, as compared with the same disease in adult life. Enteric fever is exceedingly rare under the age of two years, and it is still uncommon to meet with it until after the age of five.

Pathology.—In every case there is more or less infiltration of the solitary glands accompanied by inflammation of Peyer's patches. The lower part of the ileum about the region of the ileo-cæcal valve is specially involved. The process rarely goes on to ulceration, and consequently hæmorrhage and perforation are but seldom met with. Very early in the course of the disease enlargement of the spleen takes place, and this enlargement continues for about three weeks. This organ shows marked leucocyte

infiltration. At the same time there is a considerable degree of fatty degeneration of the heart, while the pancreas, liver, and kidneys generally show a certain amount of inflammatory change. The association of acute bronchitis with enteric fever is fairly common.

Eberth's bacillus has been found in the rose-coloured spots which appear on the abdomen, and this evidence of the disease can usually be obtained some days before Widal's reaction appears. The incubation period varies from one to three weeks.

Symptoms.—Before the onset of the disease the patient is usually out of sorts for some days. The child is apt to be irritable and cross, and is disinclined to play with his toys. The disease, however, usually comes on pretty acutely, with headache, loss of appetite, listlessness, pains in the limbs, and gastro-intestinal disturbance, vomiting being specially common. Constipation is the rule, diarrhœa the exception. In children epistaxis occurs much less frequently than it does in adults. The temperature rises progressively, but is seldom very high. A temperature of 102° and a pulse of 120 is met with in cases of average severity. The respirations are usually slightly accelerated, but if they are specially rapid chest complications should be kept in view. The tongue is furred, but the abdomen is rarely painful. The abdominal distension and tympanites, so frequently met with in the adult form of the disease, are quite exceptional in children. Hæmorrhage and perforation are rare, as ulceration of the intestine seldom occurs. Diarrhœa is never so well marked when it does occur as it is in the adult.

Two points call for special remark: these are, the spleen and the rose-coloured spots. Too much reliance should not be placed on the presence or absence of an

enlarged spleen, as in children it is often very difficult both to percuss and to palpate this organ. Neither should too much attention be paid to the rose-coloured spots, as petechiæ arising from flea-bites are very apt to mislead the unwary. When true typhoid spots do occur they are generally best seen during the second week of the disease. They are always most marked upon the abdomen, but in many cases they make their appearance upon the back. They assume the form of small maculæ which disappear on pressure.

Nervous phenomena are very commonly met with during the course of typhoid as it occurs in children. Listlessness and drowsiness, delirium and twitchings, head retraction, and slight cephalalgia, are some of the leading nervous symptoms. Bronchitis of more or less severity is almost always present. Pneumonia, however, is rare. Affections of the throat and middle ear disease sometimes supervene. Albuminuria is occasionally met with, but the most important complication is tuberculosis, which is specially apt to come on during the period of convalescence. The convalescent stage, however, is usually fairly rapid and uneventful.

Diagnosis.—Apart from the recognition of the symptoms, Widal's reaction is, on the whole, the best diagnostic test at our disposal in this disease. It is best carried out during the second week. A small amount of blood is readily withdrawn by puncturing the lobe of the patient's ear. The blood serum is added to a culture of Eberth's bacilli. If the patient is suffering from enteric fever the bacilli show clumping, and lose their motile power.

At its commencement, and even during its course, enteric fever may resemble quite a number of different diseases. *Tuberculous meningitis* may be differentiated

by noting the slower pulse, the normal spleen, the presence of tubercles in the choroid, and the absence of Widal's reaction. *Pneumonia* may be diagnosed by observing the greater rapidity of the respirations even when no physical signs are present. The disease which presents most difficulty is perhaps *acute miliary tuberculosis*. In the latter, however, Widal's reaction cannot be obtained, while the temperature continues to be raised long after the normal period for typhoid fever has been reached, while at the same time the strength of the patient becomes more and more diminished. Even these points in some cases are not sufficiently typical to warrant an accurate diagnosis, and the condition may remain quite uncertain. *Influenza* and *malaria* very often resemble enteric fever, and it is not always easy in many cases to make up one's mind as to the diagnosis.

Prognosis.—This, as a rule, is good, but it must be remembered that enteric fever may assume a grave form in young children, more especially if they have been previously weakened by disease. Tuberculosis may easily be lighted up during the period of convalescence, and should the tubercle bacillus gain an entrance, the chances of the patient's eventual recovery will be rendered much less certain.

Treatment.—The child must be kept absolutely quiet in bed. The diet should consist entirely of milk, or of milk to which lime water has been added. In many cases peptonised milk becomes necessary, more especially if there is considerable vomiting. No medicines are required beyond, perhaps, occasional small doses of ol. ricini, or of hydrarg. subchlor. If the diarrhœa is extreme, powders of bismuth. carb. and pulv. ipecac. co. may be ordered with advantage.

Nervous symptoms are best combated by the administration of small doses of sod. brom. If tympanites should occur turpentine fomentations will be found the best form of treatment. During convalescence some tonic such as tinct. nucis. vom. with gentian should be ordered, and the patient sent to the country. Relapses are best avoided by strict attention to diet, and care should, therefore, be taken not to resume ordinary feeding until some time has elapsed after the temperature has become normal.

Two special forms of treatment must be mentioned. Recently the employment of acetozone internally has been tried with some degree of success by American physicians, and seems deserving of trial. In Italy ichthyol baths are commonly used during the course of the disease, and have the effect of controlling the fever, while at the same time they seem to have a beneficial influence over the general symptoms.

ERYSIPELAS INFANTUM.

On the whole this disease is somewhat rare, and accordingly a very short description will suffice.

Symptoms.—The disease usually makes its appearance as a faint reddish blush, which may be evident on any part of the body. It very frequently, however, extends over the whole, or nearly the whole of the skin surface. The face is not immune, but is frequently the last part to be invaded by the disease. The colour becomes much deeper within a day or two of the onset, and the affected parts very often assume a somewhat dusky hue. The areas involved become swollen. The temperature rises, and is usually very high. In bad cases it tends to assume

a somewhat hectic type. In favourable cases the affected areas sooner or later resume their normal appearance, and the temperature once more becomes normal. In severe forms of the disease, however, the temperature continues to be raised, convulsions supervene, and the child dies from toxæmia.

Prognosis.—Even in severe cases the prognosis is fairly good. As a rule, however, the younger the infant the more serious does the case become, and in bad cases collapse is apt to set in at a very early period.

Treatment.—The patient should be isolated and the feeding carefully attended to. Stimulants usually become necessary ; while at the outset, and even during the course of the disease, frequent doses of hydrarg. subchlor. should be resorted to. The application of ichthyol diluted with water usually affords considerable relief. Otherwise the treatment consists in husbanding the patient's strength, and when necessary small doses of strychnine combined with digitalis should be given.

TETANUS NEONATORUM.

This is an acute infectious disease, which fortunately is comparatively rare. It is caused by Nicolaïer's bacillus, and usually makes its appearance during the first two weeks of life.

Symptoms.—Very often the first thing that attracts attention is a difficulty in nursing the infant owing to muscular rigidity. Twitchings are next observed, and the jaws become fixed. The arms, legs, and the entire body then become rigid. The hands are clenched, and the thumbs buried in the palms, while the legs are usually extended. The face generally assumes a characteristic

expression with the lips pursed out; and in the worst cases respiration becomes embarrassed owing to interference with the diaphragm and other respiratory muscles. The temperature is usually very high, and the pulse correspondingly rapid. The child becomes more and more feeble, and finally dies from exhaustion.

Prognosis.—This is a very fatal disease. Recovery, however, is much more frequent now than it was in former times.

Treatment.—The use of antitetanic serum is to be advocated in all cases, but it certainly does not meet with universal success. The injection of curare is always an available mode of treatment. The administration of chloral dissolved in milk and given by the rectum is one of the most valuable means of treatment at our disposal. By adopting this method in conjunction with the injection of antitoxin or of curare the infant's sufferings are not only alleviated, but nourishment is supplied in a form which admits of fairly ready assimilation.

WEIL'S DISEASE.

This is not by any means a common disease, but as it is occasionally met with it has been thought advisable to include it in this chapter.

Symptoms.—In every case there is a certain amount of jaundice which may be accompanied by vomiting and constipation. Albuminuria and even hæmaturia may be present. The patient rapidly becomes prostrate, and complains of headache and of pain in the neighbourhood of the umbilicus. On examination the spleen and liver will be found somewhat enlarged, while palpation of the abdomen usually causes considerable pain. In many of

the authentic cases pains in the joints have been recorded.

Diagnosis.—The presence of jaundice associated with enlargement of the liver and spleen, and the absence of Widal's reaction, serve to differentiate this disease from acute rheumatism and from enteric fever, both of which it may to some extent resemble.

Prognosis.—The majority of cases recover, and the disease is seldom prolonged beyond ten days or a fortnight.

Treatment.—The patient should be kept in bed and a milk diet ordered. Beyond this little in the way of treatment is, as a rule, necessary. It is, however, advisable to give small doses of hydrarg. subchlor. or of sod. sulph. During convalescence tonics and change of air are indicated.

CHAPTER XVI.

DISEASES OF THE SKIN.

Before considering the various diseases of the skin it may be well to point out that there is probably no single cutaneous affection which, if not actually produced by some constitutional condition, is not at least aggravated by disturbance of the general health. Thus we have many skin affections which are more or less closely associated with rheumatism, and we know that eczema is generally an indication of a disordered state of the blood. It is, therefore, important to bear this fact in mind, lest in our anxiety to treat the local cutaneous lesion we entirely overlook the general constitutional state of the patient. Another fact which is often neglected is the very frequent complexity of the skin affections met with in children. Thus urticaria and scabies often occur together, while psoriasis and eczema may be present in the same patient.

We shall now briefly refer to those skin diseases which are most frequently met with, omitting all reference to those which are strictly syphilitic in origin.

IMPETIGO CONTAGIOSA.

This is perhaps one of the commonest of all skin diseases coming under treatment in the out-patient departments of our children's hospitals. It is certainly much more

frequently met with in children than in infants. The *lesion* is typically vesiculo-pustular in character, and flat. It is usually seen in the stage of encrustation, the crusts or scabs being yellowish and closely adherent; but if they have been irritated by scratching and contaminated by dust and dirt they present a somewhat darker appearance. There is usually some itching present, but this is rarely marked. The commonest *site* is the upper lip extending from the lower nostrils, and also about the angles of the mouth. The lesion may occur, however, on any part of the face, and also on the hands, feet, neck, and even about the buttocks, while a few patches are not uncommonly met with on the scalp.

The *etiology* of impetigo is simple, the ultimate cause being undoubtedly septic infection of the skin. It is most frequently found in school children, and especially in those who are not kept clean. A common cause in infants is the sucking of the iniquitous "comforter," which is often coated with dirt of all descriptions. A running nose, and lips kept constantly wet by the chewing of various cheap confectionery, are two very strong predisposing factors in its causation. The moist surface so produced forms a very suitable nidus for the growth of micrococci, while the habit of picking at the face leads to infection of other parts, and to an aggravation of the local lesion. It is not unusual to find pediculosis capitis present as well, while involvement of the lymphatic glands is often seen. Measles and varicella undoubtedly serve as predisposing causes in some cases. Being contagious the disease can be readily conveyed from one member of the family to another.

The chief difficulty in *diagnosis* is to differentiate impetigo from pustular eczema, and in some few cases

from scabies. In the latter the intense itching is usually sufficient to distinguish it, while in pustular eczema the eruption occurs in patches, causes considerable irritation, and is usually more widespread.

The *treatment* is exceedingly simple; it consists in :—

1. Getting rid of all the crusts,
2. Applying some antiseptic ointment, and
3. Preventing the patient from irritating the lesion.

The first indication is met by using a starch poultice, or by applying olive oil to the crusts. The latter method is to be preferred, as poultices often serve to propagate the disease by rendering the skin surface moist. When the crusts have been got rid of, some such ointment as one of the following may be applied, preferably on pieces of boracic lint :—

℞ Hydrarg. Ammon. . . . gr. v. to viii.
Vaselini . . . . . ʒi.
M. Fiat Ung.
Sig.—To be applied night and morning.

℞ Ung. Sulphuris
Ung. Acid. Borici
Ung. Zinci . . . . . āā p.e.
Sig.—To be applied night and morning.

In old-standing and neglected cases, even after careful treatment, the underlying skin may show patches of discoloration due to the lesions for some time after a cure has been effected.

URTICARIA.

This affection is of very common occurrence, and illustrates very well the rule laid down at the beginning

of this section, that skin lesions almost invariably have some constitutional condition underlying them. The *lesion* consists of wheals, which usually make their appearance quite suddenly. They vary in size from a pea to a bean, and are usually surrounded by a reddish margin. Any portion of the skin may be covered with these elevations, which are intensely itching and burning in character. The child by scratching causes the adjacent skin surface to bleed, and to become covered over with a number of linear scars.

The *etiology* of urticaria is usually said to be some gastric disturbance, but lack of cleanliness undoubtedly favours its occurrence. It should also be borne in mind that certain drugs, such as belladonna, salicylate of soda, and chloral may lead to an urticarial affection of the skin.

Urticaria is often found to be very resistant to treatment, and as a rule external applications do little good unless they are combined with internal remedies. It is well, therefore, in every case to inquire carefully for the presence of gastro-intestinal troubles, worms, and, we would add, rheumatism. Remedies appropriate for these conditions must in all cases be prescribed. Most commonly it will be found that the administration of alkaline powders combined with a little hydrarg. subchlor. do more good than lotions and ointments. A very good powder is the following:—

℞ Sod. Bicarb. . . . . grs. ii. to v.
Hydrarg. Subchlor. . . gr. $\frac{1}{8}$ to $\frac{1}{2}$.
Pulv. Cinam. Co. . . . gr. i. to iii.
Fiat Pulv. Mitte xii.
Sig.—One to be given thrice daily.

Great care must be exercised as to the *feeding* of the

patient. In the case of bottle-fed babies nothing must be allowed save a simple milk and water mixture. Where solid food is being taken it is advisable to withhold porridge, eggs, most vegetables, fish, many kinds of fruit, and all sweets and pastry. The child should be fed largely on milk and milk puddings. Local applications may be used, but only as aids to, not as substitutes for suitable internal treatment.

A lotion consisting of half an ounce of ichthyol to six ounces of lime water may be tried. Favourable results may also be obtained from the use of an ointment containing one grain of thymol to an ounce of vaseline. Some cases resist all treatment, and it is well to remember that in not a few of these the association of scabies accounts largely for the aggravation and persistency of the symptoms.

SCABIES.

This is a common affection amongst children of the lower classes. It may, however, invade nurseries, and in such cases the infection is usually carried by servants. As is well known the disease is due to the invasion of the skin by the *acarus scabiei*, the female acarus being the cause of the chief lesion, which consists mainly of excoriated papules. The *site of the lesion* differs somewhat in children from that in adults. Children usually show most marked signs of the disease about the ankles, wrists, abdomen, and buttocks. The way in which the disease spreads is undoubtedly by scratching, as by this means the acari find a lodgment under the nails, where they breed. The palms of the hands often bear traces of the disease in children, while even the face is sometimes involved. In long-standing cases, however, the eruption

may show itself more or less all over the body. It is by no means uncommon to find scabies in association with urticaria or with eczema. It would seem as if the irritation of the skin produced by scabies tends to cause eczema, even in those portions of the cuticle which are unattacked by the acarus.

The leading symptom presented by scabies is *itching, which is always intense, and always most severe at night,* when no doubt the acarus is most active. The itching leads the patient to scratch the affected parts, and so we get not only papules, but also linear marks, such as one often sees in urticaria and other irritable skin affections.

The *diagnosis* of scabies in children is not always so simple a matter as it is in adults. The burrows in which the female acarus lays her eggs should be looked for in every case. They show themselves as somewhat curved linear marks, which usually have a vesicle or pustule at the extremity. The sites of the lesions should be kept in mind, while eczema and urticaria must not be mistaken for scabies. It is well to remember, however, that either of the last named may be present as well in a child suffering from scabies. The intense itching, which is always most severe after the patient has been put to bed, is very suggestive, and should always be inquired for.

The *treatment* of this affection consists in bathing the child with hot water and soap, and after drying, a little sulphur ointment diluted with vaseline should be rubbed well into the affected parts. The under-garments and bedclothes should be changed, and those in use thoroughly boiled and disinfected before being used again. The ointment should be employed for five or six nights in

succession. Duhring recommends the following formula, and it is certainly well suited for children :—

℞ Sulphur. Sublim.
Balsam. Peruv. . . . . āā ℥ss.
Adipis . . . . . ℥i.
M. Fiat Ung.
Sig.—To be applied as directed.

Where the case is complicated by eczema it is unwise to recommend bathing, and reliance must be placed on the use of unguents alone. Many cases of scabies are found to resist treatment simply because the clothing worn by the patient has not been thoroughly disinfected. Infected bedclothes are also a frequent source of recrudescence of the disease, even after a cure has become established.

ECZEMA.

True primary eczema, *i.e.* eczema due to a disordered blood condition, is somewhat rare in infancy and childhood. When eczema does occur, it is generally secondary to some such condition as pediculosis, scabies, impetigo, or seborrhœa. Primary eczema may, however, arise during teething, or in a child suffering from rickets. In this disease, indeed, it is not uncommon to meet with a catarrhal dermatitis. Again, a true primary eczema may be present in conjunction with gastro-intestinal disturbances.

The *lesion* of eczema is rarely simple. It may be erythematous, papular, or even vesicular in character, while in the later stages scales and crusts are often met with.

Eczema may affect almost any part of the body. Thus, we may meet with it on the face and upper limbs, and in

these positions it usually presents itself as an erythema with scars. The skin when irritated shows more or less exudation, while the trunk and lower limbs may be affected as well. The *papular form* may occur on the face, limbs, and body, and when the lesions are scratched we get crusts and scabs, so that the disease may closely resemble scabies. *Vesicular and pustular eczema* may also occur, and in the later stages these forms tend to be very severe. They are specially met with in the secondary varieties of the disease.

Intertrigo is really a form of eczema. It may be met with wherever skin surfaces touch, and hence we get it very commonly in the groins, axillæ, and at the bend of the elbow. The surface, in these cases, is very fiery and moist. The cause of intertrigo is the constant irritation of the skin by sweat and other secretions.

The variety known as *dry eczema*, in which scales form a prominent part of the lesion, may occur secondarily to any of the forms already named, but it may be primary in origin, and then it is very difficult to diagnose from psoriasis. The following points, however, may prove helpful. In eczema the *outline of the patch is indefinite*, whereas in psoriasis it is sharp and well defined. In eczema the *lesion is usually moist at some time or other*; this is never the case with psoriasis. There is usually a certain amount of *itching* present in eczema, while in psoriasis there is none as a rule. The position of the patches should not be too much relied on, for psoriasis in childhood may affect the flexor as well as the extensor aspects of the body. Finally, it should never be forgotten that eczema may complicate psoriasis.

There is a form of *eczema occurring in infancy* which deserves separate mention. It often begins with sebor-

rhœa of the scalp, or it may start behind the ears as an intertrigo, or it may even have its origin in a blepharitis. This variety of eczema is usually met with on the face and scalp. The skin is very red and inflamed, and moist in places. There is often very great itching, and the patient is apt to tear the parts with his nails. It is usually very resistant to treatment, and as each tooth is cut the condition becomes aggravated. It is perhaps most frequently seen in rachitic babies, and in those who are badly fed.

Of the *treatment* of eczema much might be written. The main point to keep in view is that the external treatment must always hold a second place. *The general constitutional condition must first of all be attended to.* Thus, if the child is rachitic, he should have cod-liver oil and other suitable remedies. Generally speaking, most cases of eczema are greatly benefited by a course of alkaline powders, to which a grain or less of calomel may be added; while in every case strict attention must be given to the diet, one consisting of pure milk being often exceedingly beneficial. So far as *external treatment* is concerned, all crusts and scabs must first be got rid of by means of starch poultices, or better still, by the application of oil, as the former are apt to macerate the skin. The lesions must never, under any circumstances, be touched with soap or plain water. They may be washed, if need be, with starch water; or, in the case of older children, oatmeal water may be employed. The reason for this is that bathing with soap simply washes away the newly-formed cuticle, and so retards the healing of the lesion. The best general application in a case of eczema is an ointment containing bismuth and zinc, such as for example:—

℞ Bismuth. Oxidi . . . . . ʒi.
Zinci Oxidi . . . . . ʒi.
Lanolini
Vaselini . . . . . āā ʒss.

M. Fiat Ung.

Sig.—To be used as directed.

All sources of irritation must be removed, such as pediculi, scabies, and the like. If seborrhœa of the scalp is present this must be attended to. In every case the child must be kept from scratching the affected parts, and in young children it may be necessary to put the arms in pasteboard splints, or to pin the sleeves to the gown. Crusts usually accumulate very rapidly after they have been removed, and therefore the parent or nurse should be carefully instructed to keep on removing them as soon as they show signs of recrudescence. When the face is affected by eczema it may be necessary to cover it up with a mask of lint, on which the ointment has been previously spread.

The treatment of intertrigo consists in keeping the parts thoroughly clean and dry, and for this purpose a dusting-powder consisting of equal parts of powdered starch and of the oxides of zinc and bismuth, will often be found extremely valuable.

In chronic cases of eczema nothing gives so much satisfaction as the well-known Lassar's paste, the composition of which is as follows:—

℞ Acid. Salicylic. . . . . grs. v.-x.
Zinci Oxidi
Amyli Pulv. . . . . āā ʒss.
Vaselini . . . . . ʒi.

Fiat Past.

It must never be forgotten that some cases of eczema resist all treatment until the general health has been im-

proved; and hence, in every case, attention to this matter is of the utmost importance.

PSORIASIS.

This is not such a common affection in childhood as some of the other skin conditions which we have already considered. In fact, it is extremely rare to meet with a case of psoriasis under the age of five years. It is essentially a dry and scaly disorder of the skin. The lesion is usually punctate. It may occur on any part of the body, even on the face, and it is important to remember that in the case of children it is not nearly so typically met with on the extensor aspects as is the case in adults. The scales are somewhat silvery and shining in appearance, and are always loosely adherent to the underlying skin. Itching may occur in connection with this disease, but it is never a marked feature. Psoriasis is very apt to recur, so that when once a patient has contracted the disease there is always a tendency for him to suffer from it at some future period.

The *etiology* of psoriasis is somewhat obscure, but very often a hereditary history can be obtained. Personally we incline to the belief that rheumatism is very often a cause of the disease, although statements to the contrary have been made by competent dermatologists. All the same, some of the most marked cases of psoriasis which we have met with have been in children who were either rheumatic themselves, or had a family history of this disease. In view of this fact, it is possible that those who maintain that psoriasis is not rheumatic in origin have not sufficiently acquainted themselves with the numerous and varied forms of rheumatism as it occurs in children.

The fact that *psoriasis is often complicated by eczema* cannot be too strongly emphasised, as the two diseases are frequently confused. The diagnosis has already been considered, but we would again point out that the outline of the patch in psoriasis is always sharp and well defined, whereas in eczema it is more or less indefinite.

The *treatment* of psoriasis is not always a simple matter. Keeping in view the possibility of its rheumatic origin, it is usually advisable to give salicylates, either in the form of salicylate of soda or, perhaps better, aspirin, which is more palatable. There can be no doubt whatever that these preparations have a marked influence over this disease, and this fact alone is in keeping with the rheumatic theory as to its causation. In addition to the administration of salicylates internally, hot alkaline baths prove very beneficial. The child should be kept in the bath for at least half an hour. By this means the scales are loosened and the cutaneous circulation stimulated. The best external remedy is perhaps chrysarobin, and the following prescription is of general use:—

℞ Chrysarobin . . . . . grs. v.-x.
Vaselini
Lanolini . . . . . āā ℥ss.

Another method of using chrysarobin, and one from which good results may be obtained, is to employ it in the strength of one to ten of flexile collodion, which is painted over the affected parts.

A word of warning is necessary with regard to the use of chrysarobin. *This substance must never be applied to the face*, as it will certainly produce severe inflammation of the skin. Great care must also be exercised in applying it to the scalp. For the face and scalp we prefer an

ointment containing 10 grains of hydrarg. ammon. to the ounce of vaseline.

Direct sunlight often improves these cases very much, and accordingly the patient should not only be out in the open air as much as possible, but the affected parts should be exposed to the sun's rays whenever this is at all feasible. The parents should always be warned that psoriasis is not only a somewhat difficult disease to treat, but that it is also one which will almost certainly return.

ERYTHEMA.

Erythema, or redness of the skin, is a condition of very frequent occurrence, both in infancy and during childhood. We have already considered intertrigo, which may be looked on as a variety of erythema, although we classed it under the general heading of eczema. There is a form of erythema known as E. pernio, or chilblains, but it is not necessary to do more than mention this condition here. There still remain, however, three forms of erythema to which we must allude somewhat briefly.

I. **E. Nodosum.**—In this condition we find small nodules presenting a livid colour. These may be exceedingly painful, but it is well to remember that they may occur with wonderfully little pain. Girls seem to be more commonly affected than boys. These nodules are usually met with on the legs, but they may occur on the thighs, buttocks, and even on the arms. They usually appear pretty suddenly, and during their dissolution they undergo various discolorations, somewhat after the manner of bruises. The child is usually in a poor state of health at the time of their occurrence, but the great cause of E. nodosum is, in all probability, rheumatism.

The *treatment* consists in administering salicylates, with an occasional calomel purge, and applying an ointment containing two drachms of ichthyol to the ounce of lanolin.

II. E. Symptomaticum.—The skin of children is often observed to be unusually red, and this redness may either occur in patches, or be general and diffused all over the body. The child's temperature may be raised and the redness may be evanescent, though, as a rule, it tends to disappear and reappear with provoking persistency. The lesion may be punctate or macular; it is often papular in character, so that when the hand is rubbed over the skin one has the feeling imparted as if the skin were full of tiny shot.

The origin of many of these cases is not by any means easy to determine; it should be remembered, however, that belladonna, salicylates, quinine, and chloral may produce an erythema of this nature. One of the most marked cases which we have ever seen was in a rheumatic child of six years; his temperature was 101°, and he complained of pains in his legs. He had patches of purpura behind both knees. He was thought by the parents to be suffering from scarlet fever. On the third day both wrists became markedly swollen and stiff, and the patient complained of his throat being sore. All the symptoms cleared up after a course of salicylate of soda.

III. E. Scarlatiniforme.—In this case the colour of the rash is usually a bright scarlet, and it may be punctate, but is often diffuse. The rash is usually preceded by febrile symptoms. Desquamation occurs between the third and the sixth days. There is very often a certain degree of sore throat, and there seems to be a special form associated with marked pharyngitis and tonsillitis, in

which the temperature is high and the symptoms somewhat serious. It is important to distinguish this form of erythema from scarlet fever. This is not always easy, but the following points will prove of some assistance. In contradistinction to scarlet fever, this rash does not begin in any definite situation, and is not accompanied by the typical strawberry tongue. The pulse is usually not so rapid as in scarlet fever, and vomiting rarely occurs.

The *treatment* consists in giving febrifuges, in applying calamine lotion to the skin, or dusting it over with powdered starch. When the throat is affected it will be necessary to use some local antiseptic paint, such as

℞ Glycer. Acid. Carbol. . . . . ʒi.
Glycerini . . . . . ʒiii.

In spite of what we have said there will always remain a minimum of cases in which it is impossible to distinguish E. scarlatiniforme from genuine infectious fever.

SEBORRHŒA.

There are two varieties of this disease, one, *seborrhœa sicca*, which is probably always parasitic in origin, and the other *seborrhœa oleosa*, which is really due to a hypersecretion of the sebaceous glands. S. sicca starts on the scalp, and as a rule we find more or less extensive formation of crusts, especially when the disease occurs in infancy. These crusts may be either very fine and dry, or they may be coarser in character and greasy, so that the hairs become matted together. In any case the hair always becomes coarse and brittle over the seborrhœic patches, and eventually alopecia results, which, however,

is never permanent. Seborrhœa may affect the eyebrows, face, and other parts of the body. In young children S. oleosa causes the affected surfaces to become covered over with secretion, and still later we find crusts forming just as we do in the other variety of the disease. It is by no means uncommon to find impetigo or even eczema developing in connection with seborrhœa.

Seborrhœa of the scalp has to be distinguished from psoriasis. In the latter the hairs are never shed, while the scales are always more silvery and glistening than in seborrhœa, and they are never greasy as in the latter disease.

It is almost impossible to distinguish in children between eczema of the scalp and seborrhœa, and indeed little practical good results from attempts at such a refinement of diagnosis.

Seborrhœa may readily be confused with ringworm of the scalp, but if we remember in ringworm to look for *broken* hairs, and in seborrhœa to look for *shed* hairs, there will be little difficulty in distinguishing the two diseases. In difficult cases the aid of the microscope may be called into play.

The *treatment* of seborrhœa is exceedingly simple. All crusts must first be completely removed by thorough soaking with oil. The parts should be exposed to direct sunlight, and the general hygiene of the patient should be attended to. Feeding must not be neglected, and especially in infants it is well to inquire as to the nature and regularity of the feeding. The general nutrition of the patient must always be attended to. The following ointment will in most cases effect a speedy cure:—

℞ Hydrarg. Ammon. . . . . grs. v.
Sulphur. Præcip. . . . . grs. xv.
Lanolini
Ung. Zinci . . . . . āā ℥ss.

PEDICULOSIS CAPITIS.

We need not linger over this unfortunately too common disorder. The nomenclature sufficiently indicates the cause of the disease. Lack of cleanliness certainly favours the growth of the pediculi, but it is well to remember that children so infected are usually in an indifferent state of health. If one draws a line across the scalp from ear to ear the affected region will almost certainly be found posterior to this line. In other words it is the *occipital region of the scalp* which is invaded by these parasites. It is well for the uninitiated to know that parents usually call this affection, "a breaking out of the head," or it may be, an "irritation of the scalp." In all such cases the ova, popularly known as "nits," should be looked for. These will be found glued to the hair, and in old standing cases they will be found in large numbers extending to the very tips of the hairs. Eczema and seborrhœa are very frequently present, while impetigo is not uncommonly found in association with this condition. In fact *one should make it a general rule to look for invasion of the hairs by pediculi in all cases of impetigo.* The posterior auricular set of glands is usually enlarged and may be very painful.

Treatment is exceedingly simple, but it must be thorough and energetic if it is to be successful. The affected hairs should be well soaked in paraffin, then thoroughly washed with carbolic soap. After drying it is well to rub in some simple antiseptic ointment, such as one containing 10 grains of hydrarg. ammon. to the ounce of lanoline. It is not at all necessary to cut the hair if this method of treatment is carefully carried out. It is

generally advisable to place the child under tonic treatment for a time in addition to employing local remedies.

ALOPECIA AREATA.

In this disease one or more bald patches are found on the scalp. A characteristic feature of these patches is that *there is not a single hair present.* They have always a more or less curved outline. These patches always show a tendency to extend peripherally. The skin surface involved is always smooth and often presents a polished and shining aspect. On examination of the hairs at the periphery considerable atrophy is usually found.

There are *two theories as to the causation* of this form of alopecia. Sabouraud regards this affection as *parasitic* in origin, while others, with some degree of truth, look upon it as *purely neurotic.* We meet with it in children who are anæmic, and in those who are suffering from the effects of malnutrition. It is also common enough after fevers, and one of our most marked cases occurred after a severe attack of facial erysipelas.

The only condition with which alopecia areata may be confused is *ringworm*, but the suddenness of its onset, and the fact that the area involved is completely devoid of hair, together with the absence of stumpy hairs and of scales, is sufficient to distinguish it. In difficult cases microscopic examination of the peripheral hairs will at once clear up the diagnosis.

The *treatment* is often very difficult, and necessitates great perseverance on the part of the parent and medical attendant. It is always well to see that the child has abundance of nourishing food, that he is kept in the open air as much as possible, and that in addition the scalp is

exposed to direct sunlight. Any tendency to anæmia must be corrected, while most cases are benefited by a course of cod-liver oil and syrup. hypophosph. co. In all cases a stimulating lotion, such as the following, should be prescribed :—

℞	Tr. Canthar.	ʒii.
	Liq. Ammon. Fort.	ʒii.
	Ol. Ros. Geranii	gtt. v.
	Spt. Vin. Rect. ad	ʒiv.

TINEA TONSURANS.

Tinea Tonsurans, or ringworm of the scalp, is usually regarded as a serious affection ; and so no doubt it is, as in most cases it proves exceedingly tedious. At the same time there is often considerable laxity in connection with its treatment, and this no doubt accounts for the chronicity of many of the cases. In this disease we find small round patches upon the scalp. The hairs on the patch are short and stumpy, and there are usually small scales upon the skin surface, which may present a more or less reddened appearance. These patches usually show a tendency to increase both in area and also in number.

Ringworm of the scalp usually attacks children at the school age. It is decidedly infectious, and the infection may be conveyed by means of caps, towels, brushes, and so on. The patch of ringworm may be single, and in this case it is apt to be fairly extensive. At other times we meet with a number of smaller patches. The disease may be caused by one of two parasites ; the commoner variety met with being the *Microsporon Audouini*. In this case the patches are single, or at all events few in number. They are of considerable size, and show many stumpy hairs, while the outline is distinctly round. The spores in

this case are very small and measure from 2 μ to 4 μ. This constitutes the typically chronic form of ringworm. The disease, however, in a small number of cases may be caused by the *Trichophyton Megalosporon*. In this case the patches are less well defined, being small and somewhat irregular in outline. They are apt to be numerous, and never show very many stumpy hairs or many scales. The spores are somewhat larger, measuring about 3 μ to 5 μ. These cases are much more amenable to treatment, but, unfortunately, they are less commonly met with than the form already described.

The method of examining a hair may now be referred to. Broken hairs should be chosen for examination, and it is necessary to see that we epilate the hair bulb. The hairs should first be washed in ether so as to dissolve out any fat globules, as these are very liable to be mistaken for spores, and thereafter the hair should be soaked for a few minutes in liquor potassæ. When examined under the microscope the hair bulb will be found to show abundant spores, and the hair shaft will be seen to be divided longitudinally. Mycelial threads can sometimes be seen running in the long axis of the hair.

The diagnosis of ringworm of the scalp is a matter of great importance. The points on which most reliance can be placed are:—

1st, The circular outline of the patch;
2nd, The presence of broken hairs;
3rd, The peculiar and somewhat characteristic appearance of the scales when these are present; and
4th, The microscopic examination of the hair and hair bulb.

Tinea tonsurans may be confused with alopecia, although

the latter has quite a distinctive appearance. Patches of psoriasis and eczema, when these occur on the scalp, are also quite characteristic. In seborrhœa the hairs have never the stumpy appearance that is seen in ringworm. In distinguishing favus from ringworm most reliance should be placed on the cup-shaped appearance of the crusts, and on the microscopic examination of the affected hairs. The peculiar odour present in favus may also be helpful. The chloroform test should not be omitted in difficult cases. A piece of cotton wool soaked in chloroform is brought in contact with the suspected hairs. Hairs affected by ringworm at once become white. This phenomenon is never seen in favus, nor do healthy hairs ever turn white on the addition of chloroform.

There is a complication of tinea tonsurans which deserves special mention. This is known as *Kerion*. In this condition we get acute inflammation occurring over the patch. A distinct swelling makes its appearance, which in some cases looks pretty much like an abscess which is beginning to point. Very often, however, it has more the appearance of a carbuncle, and pus may be seen oozing from the orifices of the hair follicles. It is not by any means so uncommon a complication as some writers would have us suppose. Personally it was found that most of our cases occurred after the patch had been irritated by various domestic applications.

As we have already hinted, the *treatment* of ringworm is apt to prove somewhat tedious and disappointing. The most rapid method of cure is undoubtedly epilation, followed by the thorough application of corrosive sublimate lotion. This mode of treatment, however, is very rarely resorted to, for the simple reason that its carrying out involves considerable time and trouble on the part of the

physician. Setting aside epilation, a few practical hints may now be given as to the method of treatment which holds out the greatest prospect of success. The first step in the treatment of a patch of tinea tonsurans should be its *thorough washing with hot water and carbolic soap*; this is a most essential part of the treatment, and its neglect will undoubtedly prolong the course of the disease. After thorough washing any antiseptic ointment may be applied. We need not mention all the remedies that have been suggested, but shall merely give prescriptions for one or two reliable ointments:—

℞	Chrysarobin	grs. x.
	Ol. Olivæ	ʒii.
	Lanolini	ʒi.

℞	Acid. Salicyl.	grs. xx.
	Hydrarg. Ammon.	grs. xv.
	Sulphur. Præcip.	grs. xv.
	Ol. Olivæ	ʒii.
	Lanolini	ʒi.

℞	Ichthargan	grs. x. to xv.
	Lanolini	ʒi.

We would again emphasise the fact that the treatment must be *persistently* carried out. Frequent washings of the patches with hot water and carbolic soap are very essential; but in doing this care must be taken to confine attention to the affected areas, as otherwise the disease may be spread to other portions of the scalp.

Kerion should be treated by boracic poultices, corrosive sublimate lotion, and the application of some simple antiseptic ointment, such as one containing 10 grs. of hydrarg. ammon. to the oz. of vaseline.

The infectious nature of ringworm must never be forgotten, and accordingly care should be taken to prevent its

spread to other members of the family. Caps, towels, brushes, etc., must be kept for the patient's exclusive use. The medical practitioner is often asked, When may the child return to school? One writer remarks that "slight scaliness in the patches is always suspicious." The practitioner should look carefully for broken and stumpy hairs with a lens, and if any are found he should apply the chloroform test already described, and examine some of the hairs under the microscope. If there is the slightest suspicion that the disease is still uncured a certificate enabling the child to return to school must on no account be granted.

TINEA CIRCINATA.

By tinea circinata we mean ringworm of the body as opposed to ringworm of the scalp. In this disease we get a ring-shaped lesion with somewhat pale centre surrounded by a reddened and papular margin. Towards the outer side there is usually slight scaliness to be observed.

The disease is caused by the trichophyton megalosporon. These patches may occur anywhere, and they are common enough on the neck, chest, arms, and legs, while they may even be found upon the face. In some cases tinea tonsurans is present as well.

The *diagnosis* is not always easy. Tinea circinata may be mistaken for eczema marginatum. In the latter, however, the border of the patch is apt to be more raised in appearance, while there is more or less infiltration of the diseased surface. Another point that is sometimes noticed is the occurrence of fresh rings inside the old ones, a condition which is never seen in ringworm. The shiny, glistening scales of psoriasis are sufficient to distinguish this disease from tinea circinata. In pityriasis rosea the

patches are oval in outline, and more distinctly rosy red, while the scales are exceedingly fine. Syphilitic patches may sometimes be mistaken for ringworm, but in these there is always a characteristic appearance, and there is never any uniformity of the lesions such as is seen in the case of tinea.

While the *treatment* of ringworm of the scalp is often very difficult, that of ringworm of the body is usually extremely simple. The first essential to success is the thorough washing of the patches with hot water and carbolic soap, thereafter, liquor iodi fort. may be painted on with a brush, or if preferred one or other of the following ointments may be applied :—

℞ Hydrarg. Ammon. . . . . grs. xv.
Lanolini . . . . . ℥i.

℞ Ichthargan . . . . . grs. x.
Lanolini . . . . . ℥i.

TINEA FAVOSA.

Favus usually makes its appearance upon the scalp, but it may affect other portions of the skin as well. Thus not very long ago we saw a case in which the wrist was involved as well as the scalp. In this disease small yellowish points appear over which crusts eventually develop, which are yellow in colour and cup-shaped. From the centre of the cup one or more hairs can usually be seen springing out. The affected hairs presently become brittle and fall out, so that bald areas may result. One never sees broken hairs in the patches of favus, such as are met with in tinea tonsurans. The affected areas may be small or large in size. Favus is a somewhat chronic affection, and is attended by considerable itching. At times it breaks out

as an epidemic in schools. The odour of the patches is usually said to resemble that of mice, but it is well to remember perhaps that a somewhat similar odour is sometimes given off from heads which are kept in a neglected state.

The cause of the disease is the *Achorion Schönleinii*. When the hairs are examined under the microscope the mycelial threads are seen to have a somewhat branching arrangement, while the spores are large in size and often arranged in rows like beads.

The *diagnosis* is fairly easy, as the yellow cup-shaped crusts and the characteristic odour generally distinguish it from other skin affections. It may, however, be mistaken for psoriasis, pustular eczema, and even for seborrhœa.

The *treatment* consists first of all in getting rid of the crusts. This may be achieved by thorough inunction with oil, followed by washing with hot water and soap. Once the crusts have disappeared epilation may be resorted to, while one or other of the parasiticides recommended in ringworm may be applied, such as, for example, a 10 per cent chrysarobin ointment, or the unguentum sulphuris, or in some cases an ointment containing 10 grains of thymol to the ounce of lanoline. In addition to the application of ointments the scalp must be thoroughly shampooed at least once every day. In fact, the remarks which were made with regard to the treatment of tinea tonsurans are equally applicable in the case of favus. In a few cases this disease leads eventually to a form of alopecia which is practically incurable. Favus, however, is fortunately a somewhat rare disease, and if thoroughly treated at the outset in the manner indicated, the prognosis as to complete cure is very favourable indeed.

CHAPTER XVII.

DISEASES OF THE NOSE, THROAT, AND EAR.

EPISTAXIS.

EPISTAXIS is rare in infancy, but it becomes more and more common as the age of puberty approaches. At the latter period it is much more commonly met with in the male than in the female.

The *cause* of epistaxis, which is not itself a disease, but merely a symptom, may be either local or constitutional. In the former case it may be caused by injuries or the presence of foreign bodies. The habit of picking the nose often leads to hæmorrhage, and the bleeding in this case usually occurs from the septum. Epistaxis also occurs in nasal diphtheria and in ulceration of the septum. Of the constitutional causes, the commonest are perhaps rheumatism and enteric fever, as well as pertussis and mitral disease. The amount of blood lost may be considerable, but in the majority of cases the hæmorrhage is but slight. Another cause of epistaxis which may be referred to is the presence of adenoids. As a rule, however, in these cases the blood is more likely to come from the mouth than from the nose, and a common history is that the pillow in the morning shows the presence of some blood-stained mucus.

Treatment.—The application of cold, and the use of

adrenalin solution are usually all that is required. Plugging may, however, become necessary. When a definite cause is present this must, of course, be treated, and an examination of the heart as well as a thorough local investigation of the condition of the nose and throat should be made.

ACUTE NASAL CATARRH.

This is a condition which is very commonly met with; in fact, infants and young children seem to be far more liable to this disease than older persons. The cause is often found in the presence of adenoids, although no doubt exposure to cold and wet have a certain amount of exciting influence.

Nasal catarrh would not of itself prove of much importance were it not for the fact that during infancy and childhood it may prove the starting point for more serious mischief. It is a well-known fact that an attack of acute nasal catarrh, if not carefully treated, may develop and eventually lead to the production of acute bronchitis, and, it may be, of more serious pulmonary mischief.

The *symptoms* are too well known to need description. In young children the temperature may be fairly high, and in infants who are being nursed there may be interference with sucking. Deafness and otorrhœa may result should the catarrh spread to the Eustachian tube. The pharynx is very often involved as well.

It is important to remember that in young infants suffocative symptoms may readily be induced, as the tongue is apt to fall back and obstruct the respiratory passages. Severe nasal catarrh in infancy may lead to depression of the bridge of the nose.

The *treatment* is not always an easy matter. If the patient is an infant great care must be taken that it receives sufficient nourishment. A hot bath to which mustard has been added will often prove very effectual if given at the very outset of the disease. Otherwise very little can be done save to apply vaseline or olive oil over the nostrils, and to administer a few drops of liq. ammon. acet.

CHRONIC NASAL CATARRH.

This disease is probably less commonly met with in childhood than in later adult life, but it is not at all uncommon in children who have adenoids. Apart from this we meet with it after measles and scarlet fever more particularly.

The *leading symptom* is the presence of thin watery mucus which from time to time is discharged from the nose, while much of it finds its way back downwards into the naso-pharynx. This discharge is very apt to become somewhat purulent in character, more especially when the condition occurs after scarlet fever. The presence of this secretion is very apt to lead to irritation of the pharynx, thereby producing a disagreeable tickling cough, which is usually worst at night and in the morning. In children so affected mouth-breathing and snoring are frequently observed, while deafness is by no means uncommon. This condition may also lead to headache, while attacks of sneezing are very frequent. In a certain proportion of cases the posterior pharyngeal wall appears to be red and swollen, and presents a certain amount of sticky muco-purulent secretion.

The *treatment* is difficult and very often tedious. Tonic treatment usually succeeds better than anything

else. Cod-liver oil, strychnine, and iron may be given with advantage, while warm clothing and avoidance of chills are important. If adenoids are present these should be removed. A considerable amount of relief may be obtained by syringing the nose night and morning with an alkaline lotion containing sodii bicarb. and sodii chlor., about 10 grains of each in a cupful of tepid water. Such children should spend a good part of each day in the open air so long as the weather is dry and fine.

ATROPHIC RHINITIS.

This condition consists, as its name implies, in a progressive atrophic condition of the mucous membrane of the nose, though the underlying bone may, to a certain extent, be involved as well in the process. The characteristic symptom of the disease is the presence of a certain amount of secretion of a purulent nature and possessing an extremely fœtid odour. The condition rarely occurs in infants, but is common enough in children. It has been met with before the age of five years, but it is certainly much more common between the ages of ten and fifteen. The cause of the disease is somewhat difficult to explain. Various theories have been advanced as to its origin. It is probable that in some few cases a tuberculous tendency may be present. An anæmic condition of the mucous membrane may in some cases lead to its production.

Treatment.—The use of an alkaline douche is helpful, but in our opinion the application of cotton wool saturated with an ointment containing 10 grains of ichthargan to the ounce of lanolin is one of the best methods of treatment at our disposal. Cod-liver oil and

iron should be administered, and attention paid to the general hygiene of the patient.

ACUTE TONSILLITIS.

In this condition one or both tonsils may be affected, but as a rule the inflammation spreads from one to the other. The disease is specially common in rheumatic children, though of course it may occur without any special cause being assigned. The presence of carious teeth has in many cases a predisposing influence.

Symptoms.—The disease comes on acutely. The child is seen to be ill, and may complain of pain on swallowing, though in quite young children dysphagia may be altogether absent. The temperature is also high, and may be 100 to 105 degrees. The appetite is poor, and the tongue covered with a thick fur. Examination of the throat shows the tonsils to be enlarged. They are swollen and red in appearance, while the uvula, the posterior pharyngeal wall, and the soft palate are also seen to be distinctly red and swollen to some extent.

Treatment.—The tonsils should be painted with glycerin. acid. borici; and if the case appears to be a rheumatic one, five to ten grain doses of aspirin or of salicylate of soda should be given every four hours. During convalescence tonics are usually necessary, as the child frequently shows considerable evidence of weakness after these attacks.

CHRONIC TONSILLITIS.

By the term Chronic Tonsillitis we understand chronic enlargement of the tonsils. This is usually associated with the presence of adenoids, though in some cases it

may occur independently of these. It may follow upon repeated acute attacks, as usually after these the tonsils rarely return again to their normal size. It is also very frequently met with after measles and scarlet fever. It may be present at birth, but is rarely met with before the age of three years. The enlarged tonsils are usually soft in character, as distinguished from the somewhat hard and fibrous variety met with in the adult. The enlargement may be very considerable, so that the tonsils may meet in the middle line.

Symptoms.—In the majority of cases the symptoms are due to the presence of adenoids and not to the mere fact of the tonsils being enlarged; should, however, the enlargement of the latter be considerable, mouth breathing will occur and snoring during sleep. The voice will have a nasal tone, and hearing may be considerably impaired. A disagreeable cough is very often present, and is most common just after the child has gone to bed. In many cases enlargement of the cervical lymphatic glands is found to be present.

Treatment.—Removal of the enlarged tonsils is the only method of treatment which gives any satisfaction. Apart from this the local application of iodine is in some cases beneficial. Though it rarely produces any very marked effect upon the size of the tonsils, it seems to diminish to some extent the rest of the attendant disagreeable symptoms.

The formula generally employed is the following:—

℞	Iodi	grs. vi.
	Potass. Iodid.	grs. xii.
	Ol. Menth. Pip.	♏ v.
	Glycerini	℥i.

Sig.—To be painted on the tonsils after breakfast and at bedtime.

It is always important to remember, as has already been pointed out, the connection that exists between enlarged tonsils and adenoid vegetations.

ADENOIDS.

The term adenoids, or adenoid vegetations, is the one which is most commonly adopted to signify hypertrophy of the pharyngeal tonsil. It must be distinctly understood that the latter structure is a normal one, and it is the hypertrophy of it which constitutes an abnormal condition. The pharyngeal tonsil is situated in the roof of the pharynx, and extends from the posterior nares to the anterior border of the occipital bone. It is a disputed point whether or not the pharyngeal tonsil may extend to the fossæ of Rosenmüller. Yearsley, whose observations are always thoroughly trustworthy, maintains that an enlarged pharyngeal tonsil is not uncommonly met with there, and that it may also extend up to and even into the Eustachian tubes.

The pharyngeal tonsil is composed of lymphoid tissue, which is covered over with ciliated columnar epithelium, and has a fine network of blood and lymph vessels. The lymphoid tissue is made up of delicate white connective fibres with lymph spaces between. Lymph nodules are present in addition, and these are composed of groups of lymphocytes. Inflammatory changes are frequently met with and the tissue may undergo hypertrophy. Atrophy, however, sometimes occurs, and this may be associated with atrophic rhinitis.

Two *varieties* (according to Yearsley) are met with :—

(1) The fibrous or hard variety, and

(2) The gelatinous or soft form.

The adenoid mass may be either sessile or pedunculated. The question of the *association of adenoids with tuberculosis* is a matter of considerable importance. Probably not more than 5 per cent of enlarged pharyngeal tonsils are tuberculous, and even in many of these the condition may be quite latent. As a rule no other evidence of tuberculosis is found. Even in these cases the condition is probably always secondary to infection from tuberculous sputum, though it is quite within the range of possibility that it may form the starting point of mischief elsewhere.

Etiology.—Adenoids are most commonly met with during the period of early childhood. The greatest number of cases are met with after the age of three. They may, however, and not infrequently do, occur in infancy. The age limit of greatest incidence is usually stated to be between six and fifteen. They are quite as common in the one sex as in the other, and very frequently several members of the same family are found to suffer from this condition. They are met with fairly frequently in Mongolian idiots and also in cretins, though this is merely a coincidence.

Diseases which have a tendency to produce catarrh of the upper respiratory passages are likewise those which have a tendency to be associated with adenoids, and in this respect rachitis is specially noteworthy. We find that ordinary colds of a catarrhal nature specially predispose to adenoids; while the exanthemata, notably scarlet fever and measles, seem to have some causal relationship to adenoids, though we incline to the belief that the latter merely become more marked after an attack of one of these fevers. In the same way adenoids may be met with after attacks of influenza, mumps, and varicella. Diphtheria is more apt to

occur in children affected with adenoids than in others, while this disease may be the starting point for enlargement of the pharyngeal tonsil. Whooping-cough is sometimes found associated with adenoids, while repeated attacks of tonsillitis or of pharyngitis are very liable to be followed by the development of adenoids. It has recently been pointed out that nasal douching, more especially with irritating substances, may play a leading part in their production.

A family history of tuberculosis can sometimes be obtained, and in some of our cases rheumatism seemed to play a prominent part in their production. Adenoids are said to be frequent in children who are the subjects of congenital syphilis, but of this we have had no practical experience. Certain anatomical peculiarities have been stated by some authors to result from the presence of adenoids, but on the whole we incline to the view that many of these abnormalities have little or nothing to do with their production, but are merely associated with these growths. Thus the high palate and the contracted jaws, so commonly met with when the pharyngeal tonsil is enlarged, are not necessarily due to this cause, as such conditions occur in children who certainly cannot be said to suffer from adenoids. So, too, deviations of the septum, contracted nasal fossæ, and cleft palate may be found associated with adenoids, but are not necessarily due to their presence.

Symptoms.—In considering the symptoms of this condition we must be careful on the one hand to avoid attributing too much to the presence of adenoids, and on the other hand disregarding their presence as a causal factor in the production of pathological states. While there are undoubtedly many cases of adenoids which



PLATE VIII.—Male, æt. 3 years, with Adenoids and Enlarged Tonsils. The open mouth and the broad nasal bridge are well brought out, while saliva may be observed on the chin, and mucus just below the left nostril.

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present no symptoms whatever, we have to consider cases which do give evidence of their presence as they occur, first in infancy, and secondly in childhood.

1. *In Infancy.*—Before the age of two years adenoids always show a predominance of *catarrhal* symptoms. Such children are apt to have difficulty in sucking, while snuffling is extremely common. A nasal discharge, which may at times be blood-stained, is often present. Some cases, of which we recently met with a noteworthy example, present a cough which so closely resembles that of pertussis that it cannot possibly be distinguished from it. Occasionally there may be marked difficulty in breathing, for which no definite cause can otherwise be assigned.

2. *In Childhood.*—After the age of two years the catarrhal symptoms persist, while those of *obstruction* become superadded. Children with adenoids have a *constant running from the nose*, a condition of chronic nasal catarrh. The patient *snores at night*, and while asleep lies with his mouth open. Very frequently such patients keep the mouth open during the day as well. *Restlessness at night* is extremely common, owing to the difficulty of breathing, which is increased when the child lies down. The voice is apt to assume a nasal tone, while hoarseness is a very constant accompaniment. Children with adenoids are very liable to have frequent attacks of ear trouble, *deafness* being often a marked feature of the case. This deafness may be due either to mechanical obstruction of the Eustachian tubes or to otitis. The child sooner or later becomes anæmic, and debility associated with malnutrition and gastric troubles is very common. Owing to imperfect respiration the *chest becomes deformed.* It becomes narrow in front, especially at the upper part,

and as a whole its respiratory capacity is diminished. Looking at the child from behind we note the rounded shoulders, the projecting scapulæ, and not uncommonly a certain amount of antero-posterior spinal curvature. The facial expression is often very typical. The child has a *dull and stupid appearance.* The nostrils are narrow, while the bridge of the nose is considerably broadened. On looking into the mouth the palate will be found to present a very high arch, while the jaws are narrow, and the teeth crowded together.

It is said that children with adenoids are more liable than others to colds and to bronchitis, but as a matter of fact these attacks of bronchitis are due, not to the adenoids, but to an extension of the catarrh which they are apt to produce.

Apart from what has been already mentioned, certain other conditions are frequently found associated with adenoids, but as has been already pointed out, this is very often merely a matter of coincidence. We would specially mention their association with night-terrors, catarrhal spasm of the larynx, asthma, enuresis, recurrent headaches, and even epileptiform seizures. Finally, we would emphasise the fact that diphtheria seems to attack children with adenoids more frequently than those who have no enlargement of the pharyngeal tonsil. The relation that exists between deafness and adenoids is a very close one, and accordingly whenever a child suffering from deafness is brought for advice the question of adenoids should always be raised.

Diagnosis.—This is best made, not by symptoms alone, but by actual local examination of the parts, which may either be carried out digitally or by means of posterior rhinoscopy.

Treatment.—Palliative treatment is usually of little or no value, but occasionally syr. ferri. iodidi. seems to do good. Operative treatment, however, undoubtedly gives the greatest hope of success. The indications for operation, according to Yearsley, are when we have:—

1. Symptoms arising from nasal obstruction.
2. Ear complications.
3. Reflex disturbances.
4. Obstinate post-nasal catarrh.
5. Enlargement of the cervical glands; and, lastly, he states that operation might be performed as a prophylactic measure.

The *treatment after operation* is of considerable importance. The child should be kept in bed for three or four days. Vomiting of blood not infrequently occurs, but this need not cause any alarm. The child should be instructed to clear the nose regularly, and nasal breathing should be encouraged as much as possible. Singing, reciting, and out-door exercises will do much to promote complete cure.

RETRO-PHARYNGEAL ABSCESS.

This consists in the formation of an abscess between the pharynx and the vertebral column. This abscess most commonly occupies the more strictly oral portion of the pharynx. It may, however, occur in the naso-pharynx or even in the laryngeal portion. It is seldom if ever met with after the period of infancy. Its most common cause is septic infection of the lymphatic glands which lie behind the pharynx. In a few instances it comes on in connection with cervical abscesses, while in quite a number of cases it occurs in association with disease of the upper cervical vertebræ.

Symptoms.—The first symptom to attract attention is usually difficulty in swallowing. Cough and dyspnœa are usually next noticed. The child shows a tendency to keep its head thrown back, and the neck may be found to be more or less stiff. The temperature will be raised and the child will present the usual symptoms of a febrile condition. In some cases a definite swelling can be made out just below the jaw, while in other instances a tumour is present behind the ear. When the throat is examined, a procedure which is not always easy in such cases, distinct bulging from the posterior wall of the pharynx can be made out. If it is impossible to inspect the parts, one of the fingers, preferably the little one, should be pushed backwards towards the posterior pharyngeal wall.

Treatment.—Free incision is the only available method of treatment. The child should be firmly wrapped round in a blanket and held in the nurse's arms. Having opened the mouth an incision should be rapidly made into the swelling, and thereafter the patient's head should be at once thrown forward so as to avoid the contents of the abscess from gaining entrance into the respiratory passages. When the condition is the result of cervical disease the operation may be performed from the neck, as by this means more rigid antiseptic precautions can be observed; but this is not necessary or even advisable in ordinary cases.

LARYNGISMUS STRIDULUS.

This condition is perhaps more correctly termed, Laryngospasm. It occurs in two classes of cases:—

1. It may be present from birth, and constitute what is known as *Chronic Infantile Stridor.* In this case inspiration is accompanied by a curious croaking sound,

which is first noticed almost immediately after birth. This sound occurs during inspiration, and may in some cases become more crowing in character. It frequently disappears for a time, but in many cases is constant during both day and night, not ceasing even during sleep. There is rarely any evidence of dyspnœa, though in some cases slight sucking in of the intercostal spaces may be observed. This condition tends to disappear as childhood approaches. It has been described by a number of observers, but the most commonly accepted view of the condition seems to be that the sound is the result of a congenital narrowing of the aperture of the glottis, the aryepiglottidean folds being in contact. The fact that the condition tends to disappear as the infant grows older tends to bear out this view of the phenomenon. It is only right to state that other observers have arrived at the conclusion that the condition is due entirely to a sucking in of the upper aperture of the larynx as the result of inco-ordination of the muscles.

2. This variety occurs *in rachitic children* more especially, though it may be met with in other cases as well. It differs from the first variety in the fact that it only occurs at intervals, and is not persistent. The parents usually describe the condition by saying, "that the child seems at times to catch his breath, and to become stiff and black in the face." Indeed such cases are often brought to us with a history of "fits." What we usually find is that the child, apparently perfectly well, is suddenly seized with a spasm of the larynx, during which his breathing is interrupted, and the lips and face become somewhat cyanotic. As a rule a distinct crowing sound can be heard at the beginning of the attack, while the latter usually terminates as abruptly as it came on

with a prolonged laryngeal stridor. In rachitic children this reflex spasm of the larynx may be induced by very slight causes, such as a draught of cold air, or by being suddenly startled.

Treatment.—During the paroxysm a hot bath or a cold sponge applied to the chest usually cuts the attack short. Afterwards the constitutional condition producing the disease should be treated. Douching of the spine and the administration of cod-liver oil will usually prevent a recurrence.

ACUTE LARYNGITIS.

This disease is sometimes termed "false croup," but as croup is a name that should never be employed, the alternative term "false croup" is still more to be avoided. The condition consists in swelling of the mucous membrane of the larynx accompanied by a certain amount of catarrh. It usually occurs secondarily to naso-pharyngeal catarrh, while it may lead to inflammation of the trachea and bronchi. Cold and damp, and in some cases a rheumatic predisposition lead to this affection of the larynx.

Symptoms.—The temperature varies between 102 and 104 degrees. The most characteristic symptom, however, is hoarseness associated with a more or less irritating cough. In young children, owing to the narrowness of the larynx, it is not uncommon to meet with very alarming symptoms. The child may suddenly show marked difficulty in breathing. He becomes excited, and unless relief is obtained he may present all the evidences of a well-marked case of laryngeal diphtheria. These attacks are usually called "croup" by the laity, but they are never associated with anything save a simple catarrhal laryngitis.

Treatment.—The child should be kept in bed and the atmosphere kept somewhat moist by the use of a bronchitis kettle, to which some oleum eucalypti has been added. In addition small doses of vin. ipecac. are advantageous. Should suffocative attacks occur teaspoonful doses of vin. ipecac. should, if possible, be administered with a view to induce nausea. Hot fomentations applied to the neck are sometimes useful.

CHRONIC LARYNGITIS.

Naturally this condition is not nearly so common as the acute form of the disease. Its cause may be syphilitic or tubercular infection, while it may follow repeated acute attacks. The only symptoms present will be hoarseness and cough.

The *treatment* consists in attention to clothing, the administration of suitable constitutional remedies, and change of air.

PAPILLOMA LARYNGIS.

This is the commonest of all laryngeal tumours met with in childhood. The condition is usually multiple. At first the leading symptom is that of *hoarseness*, which tends to become more and more marked; eventually *dyspnœa* supervenes, which is always most evident while the child is asleep, but tends to be present while he is going about, as time goes on. Cough is a variable symptom, but it is very often present. Whenever a child is brought with a complaint of hoarseness which has been present for some time, and difficulty on breathing which first showed itself during the night, but which is now

evident in the daytime as well, a very thorough examination of the larynx should be made.

Treatment.—The only available treatment is removal of the tumours, which, however, have always a distinct tendency to recur. The method of operation need not be described in detail; it is sufficient to remark that it often presents considerable difficulty.

OTALGIA.

Pain in the ear is a very frequent symptom during both infancy and childhood. It is very commonly met with during the dentition period, because the inferior dental nerve which supplies the teeth communicates with the otic ganglion which sends a branch to the membranum tympani. If the patient is an infant he will cry whenever the ear is touched, and will be noticed to put his hand frequently up to his ear, or to roll his head about on the pillow. Otalgia also occurs in connection with tonsillitis and enlargement of the tonsils. Aural furuncle is commonly a source of excruciating pain, so also is external otitis. Accumulations of wax produce not only pain but a varying amount of deafness as well.

Lastly, we have to remember that acute otitis media produces a pain which is worst at night, and also on swallowing, while if the case is a purulent one the symptoms often very closely resemble those of meningitis.

Treatment.—In every case the cause must be carefully sought for, and if possible removed. Warm oil dropped into the ear sometimes affords relief, so also does hot salt placed in the finger of a glove. Failing these measures the following prescription may be tried:—

℞ Tinct. Opii . . . . . ℥ii.
Tinct. Belladonn. . . . . ℥ii.

Sig.—Thirty drops to be warmed and placed on a pledget of cotton wool to be inserted into the ear.

℞ Eucain. Hydrochlor. . . . grs. ii.
Acid. Carbol. Liq. . . . . ℥ss.
Glycerini . . . . . ℥ss.

Sig.—A few drops to be placed on cotton wool and inserted into ear.

DEAFNESS.

Deafness is a very important symptom, and one for which there is quite a variety of causes. We would specially mention adenoids, enlarged tonsils, and pharyngitis. Accumulations of wax in the ear cause not only deafness but also a certain amount of pain. This symptom is not uncommonly met with during convalescence, or even after complete recovery from measles, scarlet fever, and mumps. Deaf children are always very backward and inclined to have a dull and stupid appearance, which will be intensified if the condition is associated with adenoids and enlarged tonsils.

A passing reference must be made to the condition known as *deaf-mutism*. This is sometimes a congenital affection, but it is often acquired after attacks of middle ear disease, or of inflammation of the labyrinth, or it may be of meningitis. Deaf-mutism in such cases usually occurs owing to the fact that the child has become deaf before the faculty of speech has been acquired.

CERUMEN.

The presence of ceruminous masses almost always indicates excessive secretion from the glands. This is

usually altered in character and tends to accumulate in consequence. It is simply due to increased functional activity of the ceruminous glands. In such children, as has been recently pointed out, adenoids are very frequently present. The symptoms associated with this condition are usually four in number, viz., deafness, earache, headache, and reflex cough.

The treatment consists in first softening the hardened secretion by instilling thirty drops of the following solution, previously warmed, into the ear :—

℞	Sod. Bicarb.	grs. x.
	Glycerini	℥ii.
	Aq. Dest. ad	℥i.

Thereafter the accumulation may be removed by carefully syringing the ear with warm boric lotion.

FOREIGN BODIES IN THE EAR.

These may require the administration of chloroform for their removal. Syringing must never be employed in such cases when the foreign body consists of articles such as peas, which would tend to swell up in contact with water. Sometimes foreign bodies may be removed by means of a fine pair of forceps or a piece of wire bent into the form of a hook. Should these methods fail, such cases should be referred to a specialist, and in no case must repeated forcible attempts be made at removal, otherwise serious damage to the internal ear may result.

OTORRHŒA.

A discharge from one or both ears may be met with under quite a variety of conditions. It may be produced

by *eczema of the external meatus*; so too in *furunculosis of the meatus* we frequently have a discharge accompanied by intense pain. More important still is the otorrhœa associated with acute and chronic *suppurative otitis media*. A discharge from the ear is not uncommonly seen in those who suffer from *adenoids* and *enlarged tonsils*, and as adenoids are frequently met with in rachitic children, otorrhœa is very common in such subjects. In fact the membranum tympani is rarely normal in children affected with rickets. Otorrhœa is also met with after attacks of *influenza, measles, scarlet fever*, and *mumps*. The presence of ceruminous masses in the ear may produce a secretion which is very apt to be mistaken for otorrhœa.

Two groups of cases may be distinguished. In the first we have a *discharge without the history of previous ear symptoms*. In some of these cases the patient may be too young to complain, while in others some throat condition may precede the otorrhœa. To this group belong the cases of otorrhœa met with in connection with adenoids and rachitis. In the second group *we have discharge from the ear which is preceded by well-marked aural symptoms*, and there is always more or less pain accompanied by a rise of temperature, which, however, usually subsides when the otorrhœa makes its appearance.

Treatment.—The essential point to attend to in all cases of otorrhœa is to keep the ear as dry as possible. It should be syringed regularly with boric lotion, a ball syringe being used by preference. The ear should afterwards be thoroughly dried out with cotton wool. Should the discharge become chronic, peroxide of hydrogen may be instilled, or, if preferred, twenty drops of a solution containing one grain of hydrarg. perchlor. to the ounce of rectified spirit.

Many of these chronic cases are benefited by Politzerisation of the middle ear. Attention should be directed to the treatment of any eczema which may be present, while adenoids and any accompanying throat condition should receive attention. In all cases the general health of the patient must be carefully considered.

OTITIS MEDIA ACUTA.

The causes of acute middle ear disease are somewhat varied. It is very frequently met with secondarily to conditions of the naso-pharynx. Attacks of nasal catarrh or of pharyngitis may lead to it, while children affected with adenoids are specially liable to this disease. It is a common sequela of scarlet fever, measles, pertussis, typhoid, and influenza; while it must be remembered as an occasional complication of broncho-pneumonia.

The condition may be either a *simple* or a *purulent* one.

Symptoms.—The leading symptom is pain. The child screams whenever the ear is touched. In the case of young children it will be found that they are constantly putting their hand up to the affected ear. The temperature rises, and vomiting with convulsions is very often met with. The patient will often be noticed to roll the head about on the pillow. If the condition is a purulent one the symptoms will, of course, be much aggravated. Rupture of the membranum tympani generally occurs sooner or later, and with the escape of the pent-up secretion the pain subsides, while the temperature once more becomes normal.

Complications.—The complications of middle ear disease are very important. They are all of a serious nature.

Mastoiditis may occur. It is common in influenzal and pneumonic cases, while in the latter the pneumococcus may be present in the pus found in the antrum. The other complications are meningitis, cerebral abscess, thrombosis of the cerebral sinuses, facial paralysis and disease of the labyrinth.

Treatment.—The chief indication in the treatment of acute middle ear disease is the relief of pain. This is best met by the application of dry heat. Syringing with warm boric lotion is often very soothing, while the instillation of a few drops of a five per cent cocaine solution has a similar effect. Most cases are benefited by the administration of a dose of calomel. Paracentesis of the membrane may become necessary. It is of the greatest importance that strict attention should be paid to the throat and nose with a view to maintaining these cavities in as antiseptic a condition as possible. Operations on the mastoid antrum may have to be performed, either at the time or subsequently.

CHAPTER XVIII.

DISEASES OF THE EYE.

BLEPHARITIS.

INFLAMMATION of the eyelids is met with in association with eczema and with affections of the eyelashes. It is also very common in delicate children, and in those who suffer from errors of refraction. Conjunctivitis and keratitis may also induce it.

The lid margins become red and covered over with scales. A certain amount of secretion appears, and when the eyelids are closed during sleep this secretion tends to make them stick together. As the secretion dries it forms crusts upon the surface. Should the case remain untreated little ulcers may form which will lead to a shedding of the hairs which are then permanently lost.

Treatment.—The cause must be sought for in all cases and if possible removed. For the local condition we advise removal of the crusts by the application of oil. The eye should be flushed out with boric lotion, and a little mild antiseptic ointment applied to the margins of the lids. The administration of cod-liver oil and syrup of the iodide of iron is always indicated when the patient's condition warrants it.

HORDEOLUM.

This is in reality nothing more or less than a furuncle in connection with a hair follicle. It is a very common condition, and is specially met with in children suffering from errors of refraction, whose health has become deteriorated. At the start a little swelling is seen upon the margin of the lid, and this is exquisitely tender. In a short time the surrounding parts become œdematous, and eventually suppuration occurs, which is shown by the presence of a minute yellowish point at the summit of the swelling.

Treatment.—Hot compresses are usually very comforting to the patient. When suppuration occurs the pus should be evacuated and some mild antiseptic ointment thereafter applied. In all cases errors of refraction should be corrected. The gastro-intestinal tract must be attended to, and any constipation that exists must be removed. The subsequent administration of cod-liver oil and iron is usually of advantage.

BLEPHAROSPASM.

This may occur in two different forms:—

1. **Clonic Spasm of the Orbicularis Palpebrarum.**—This form is sometimes termed nictitation, and consists in repeated involuntary winking of the eyelids. It occurs in neurotic subjects and in those who are suffering from chorea.

2. **Tonic Spasm of the Orbicularis Palpebrarum.**—This is really the more genuine form of blepharospasm, and in it either one or both eyes may be affected. The child absolutely refuses to open the eye, and keeps his head bent down or buried in his nurse's lap.

The cause of this condition may be simply a neurotic tendency, but it is more likely to result from some irritation of the cornea or conjunctiva. Thus it is very frequently associated with phlyctenular conjunctivitis and keratitis. It is also met with in connection with irritation of the fifth or of the seventh facial nerves.

Treatment.—The condition of the conjunctiva and cornea usually require attention. In neurotic cases the spasm as a rule passes off very rapidly if the child's eye is immersed in a basin of cold water.

CONJUNCTIVITIS.

This disease presents quite a variety of forms, and we shall briefly refer to those most commonly met with.

1. **Simple Conjunctivitis.**—In this form the palpebral and ocular conjunctivæ are affected. It may be due to cold or to the presence of dust, while it frequently occurs in connection with nasal catarrh. Another common cause is errors of refraction, and it also occurs in association with certain of the infectious fevers, notably measles.

The conjunctiva becomes red and swollen. There is more or less secretion, so that the lids are found adherent in the morning. There is very often a considerable amount of burning pain and itching accompanied by a sensation as of sand in the eyes.

Treatment.—The treatment of these cases is exceedingly easy and satisfactory. Boric lotion should be used freely, and a little yellow oxide of mercury ointment applied to the lids at bedtime.

2. **Purulent Conjunctivitis.**—The form of purulent conjunctivitis most commonly met with in infancy is *Ophthalmia Neonatorum.* This occurs at birth, infection

being due to leucorrhœal or gonorrhœal vaginal discharge. The conjunctiva is intensely inflamed and the purulent secretion is profuse. On separating the lids the latter simply gushes out. In a few days the eyesight will become completely destroyed unless the condition is promptly and energetically treated.

Treatment.—Prophylaxis by attention to the mother before the birth of the child, and by carefully cleansing the eyes after birth, is most necessary. To remedy the condition when actually present we must flush out the eyes every hour with boric or corrosive sublimate lotion. The lids should be everted at least once a day and touched with a 10 to 20 per cent protargol solution. Corneal ulcer is apt to develop very rapidly in these cases, and its formation can only be avoided by the most energetic treatment.

3. **Phlyctenular Conjunctivitis.**—This is a very common eye condition in children, especially in those who have a scrofulous taint. Such children often have enlarged glands and a certain degree of eczema as well. It may, however, come on during convalescence after measles or scarlet fever. If the child's surroundings are unhygienic he will be specially liable to this disease.

In this condition we find one or more vesicles at the very edge of the cornea. These phlyctenules, as they are termed, are apt to form little ulcers, and they may even extend to the cornea, forming there a most intractable ulcer. Photophobia may be present in an extreme degree in this condition, so that blepharospasm is often a well-marked feature in such cases. The conjunctiva in time becomes markedly red and there is more or less excessive secretion present.

Treatment.—The diet should be a milk one, and strict

attention must be paid to cleanliness. At the outset a dose of calomel may be administered. The child should have as much fresh air as possible, while cod-liver oil and syrup. ferri iodidi may be given. The local treatment consists in placing a shade over the affected eye, which should be constantly bathed with boric lotion. The application to the phlyctenule of yellow oxide of mercury ointment should always be made. If ulcers form, these should be dusted with calomel. Blepharospasm is best treated by placing the child's face in a basin of cold water and holding it there until the spasm passes off. The instillation of a little weak cocaine solution has a similar effect.

4. Follicular Conjunctivitis.—This is a very infectious variety, and is liable to break out in the form of epidemics in schools. When we examine the conjunctiva in such cases we find minute rounded and translucent elevations, which are best compared to particles of sago. There is always a certain amount of pain and of photophobia in this condition.

Treatment.—The treatment consists in isolating the patient and in keeping all towels and sponges for his own separate use. The eye should be frequently flushed out with boric lotion, and twice a day the following ointment should be smeared along the edges of the lids:—

℞	Hydrarg. Oxid. flav.	grs. vi.
	Ichthyol Ammon.	grs. xxx.
	Vaselini alb.	℥i.

Sometimes a 0·5 per cent solution of protargol dropped into the eyes three times a day is beneficial.

5. Vernal Conjunctivitis.—This form is more frequently termed spring catarrh. It tends to recur during each succeeding spring and summer season. The leading

symptom in this form is marked itching, and there is usually very little pain. The ocular conjunctiva, when examined, is found to be swollen, while the palpebral surface is covered over with a number of minute elevations. Lachrymation is often excessive.

Treatment.—No single form of treatment as a rule has much effect in checking the progress of this troublesome condition, which is apt to recur every year. For the relief of itching a very weak ichthyol lotion may be used. In some cases the eyelids may be scarified and then thoroughly rubbed over with an antiseptic lotion. This operation, which is known as grattage, frequently produces good results.

6. Granular Conjunctivitis.—Another name sometimes employed in the description of this condition is *Trachoma.* This is an exceedingly contagious disease which affects the palpebral surface of the conjunctiva. It is the secretion which is infectious.

The exact cause of trachoma is not very well understood, but debilitating conditions and a scrofulous habit undoubtedly predispose to it.

This is an essentially chronic disease. The palpebral conjunctiva is covered over with a number of minute nodules, so that its surface becomes roughened, while at the same time its vascularity becomes increased. The ocular conjunctiva is more or less reddened. There is usually a certain amount of muco-purulent discharge, and the lids are often greatly swollen. In many cases the cornea becomes involved in the process.

Treatment.—The treatment of trachoma is an exceedingly difficult matter. Constitutional treatment must be attended to in every case. The general hygienic surroundings of the patient must be seen to and tonics freely

administered. Locally the application of an ointment containing 15 grains of ichthargan to the ounce of vaseline seems to give as good results as any other form of local treatment.

KERATITIS.

Three forms of keratitis will be briefly considered.

1. Interstitial Keratitis.—This is a chronic form of inflammation involving the whole of the cornea. It may be due to rheumatism or to scrofula, but as a rule it is the result of inherited syphilis. It does occasionally occur in connection with infectious fevers, but the three conditions mentioned are its main sources of origin.

The cornea becomes covered over sooner or later by an opacity, and vision is considerably reduced. The cornea tends to become vascularised, and in these cases what is known as "salmon patch" is produced. Photophobia, pain, and lachrymation are all present to a greater or less extent. The condition may be complicated by iritis, while in a few cases retinitis may develop.

Treatment.—The administration of one grain of hydrarg. cum cret. frequently repeated usually produces successful results, while at the same time inunctions of mercurial ointment into the skin may be employed. Milk diet must be ordered and attention to the gastro-intestinal tract should be enjoined. In rheumatic cases salicylates may prove of service, while in scrofulous cases cod-liver oil should always be given a trial. The patient should live as much as possible in the open air and should attend to the ordinary principles of hygiene. Locally atropine may be instilled into the eye once a day. The eye must also be protected from direct light. At a later stage in the disease much advantage is derived

from applying to the cornea a weak yellow oxide of mercury ointment. Unless the condition is properly treated permanent opacity of the cornea may result, or even iritis and the formation of synechiæ.

2. **Phlyctenular Keratitis.**—This form of keratitis is frequently met with in children with adenoids or enlarged cervical glands. Inherited syphilis may also lead to its occurrence, while bad hygiene and attacks of infectious fever may prove factors in its production.

The photophobia is usually very intense. The area around the cornea is markedly red and there is excessive lachrymation present. The child complains of a feeling as of sand in the eye, and is constantly rubbing it with the fingers.

Treatment.—A shade should be worn over the eye, and the latter should be frequently bathed with boric lotion. Fresh air, bathing, and general hygienic measures should be ordered, while tonics such as cod-liver oil and iron are always indicated. The complication which is fairly common, and one which is most dreaded, is ulceration of the cornea, which may eventually lead to its perforation.

3. **Herpetic Keratitis.**—This is a somewhat rare disease. Minute swellings may be seen on close examination of the corneal surface. There is usually a considerable amount of pain, but there is very little vascularity of the circumcorneal conjunctiva.

Treatment.—The local treatment consists in the application of calomel and of yellow oxide of mercury ointment, while tonics should be administered internally. Hot fomentations may be employed to relieve the local pain, but in most cases the condition clears off without leaving any permanent bad effects.

ULCERATION OF THE CORNEA.

There is quite a variety of ulcers described, but we shall limit our consideration for the present to the treatment of the simple form. Atropine should as a rule be instilled into the eye as this serves to keep the pupil dilated. A weak mercurial ointment should be rubbed along the edges of the lids, and then the latter may be moved gently over the corneal surface. Internally cod-liver oil and syrup. ferri iodidi may be given. In very intractable cases, when the condition tends to become chronic, the application of a 5 per cent solution of iodine vasogen should be given a trial.

CORNEAL NEBULÆ.

By the term nebula we simply mean an opacity or haziness of the cornea. This results from ulceration, and may usually be cleared up by applying yellow oxide of mercury ointment to the part. Local massage and iridectomy may be indicated in certain cases. Tatooing of the cornea gives very good results in quite a number of instances.

ERRORS OF REFRACTION.

These errors of refraction form a source of trouble, more especially during the school age.

Myopia may follow upon a congenital hypermetropia in consequence of the child's reading in a bad light, or using the eyes too much. The patient is unable to see distinctly letters placed at a considerable distance, and when reading holds the book very close to the face. Pain over the eye and photophobia are sometimes present; headache, however, is rather unusual.

Hypermetropia.—Hypermetropia is of more importance from a strictly medical point of view. In this condition the patient cannot see objects distinctly when held close to him. Much reading tends to cause a pain in the eyes and a sensation of heat. It is this condition which so frequently causes frontal headache and facial neuralgia.

The *treatment* of these two conditions forms part of the work of the ophthalmic surgeon rather than of the physician. It is well to bear in mind, however, that such symptoms as headache, blepharospasm, nictitation, giddiness, and it may be even actual vomiting, are sometimes the result of an uncorrected hypermetropia.

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