segmental series of glands which were once related to the genital and excretory apparatus of each segment, and still retain, though greatly modified in each successive gland, the fundamental property of influencing growth and reproduction. How the tissues are affected by the secretion of the thyroid is an enigma. But the fact is certain. For the adrenal cortex even so much as that cannot be said. There is only the conjecture that this fatty substance is essential to a man's strength and manhood. The aboriginal natives of Australia threw boomerangs in curves that long puzzled the wits of the mathematicians of Europe. Their practical instinct seems also to have taught them what the medicine men of civilized life are now slowly reasoning out. To the Australian or "black fellow doctors" the fat above the kidney was magic. If by incantations it could be removed from an enemy as he slept, the victim would surely lose his strength and die.³ We know as much, that there is no warm-blooded life without these glands. Since the first experiment that Ringer watched twenty years ago we have learnt how they sustain the pulse of life, and we look to the future with a great surmise of what will come from an extension of this knowledge. But the chief gift is long delayed. Adrenalin is a more convenient haemostatic than the old-fashioned cobwebs. Apart from that, therapeutics have gained nothing from all this new knowledge, and Ringer's comparative indifference to its birth was a prognosis that, to our regret, has been justified so far as his lifetime extended.

REFERENCES.

- ¹ See diagram, reproduced by permission from *Brain*, vol. xxxv, p. 313, 1913. ² Grigaut, *Le cycle de la cholestérinémie*, Paris, 1913. ³ Howitt, *Native Tribes of South-East Australia*, p. 367, London, 1901.

An Address

ON

SOME CLINICAL ASPECTS OF THE BODY TEMPERATURE IN CHILDHOOD.

DELIVERED BEFORE THE SOUTH-WEST ESSEX DIVISION OF THE BRITISH MEDICAL ASSOCIATION.

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THE vagaries of the body temperature in childhood are frequently perplexing and difficult to understand. In early life the temperature is very variable and uncertain; it may show marked oscillations from slight or trivial causes or rise to a considerable height for no apparent reason. On the other hand, a child may be seriously ill, perhaps with bronchitis or empyema, and the temperature chart will record but little variation from the normal. The heat-regulating centres in childhood, as is the nervous system generally, are in an unstable condition, and may be influenced by emotional or slight physical causes, or they may fail to respond in the way we should naturally expect to a stimulus sufficient to cause a definite amount of fever in the adult. Undue stress, therefore, must not be placed upon the temperature of children. A transitory rise, even though it may be to 102° or 103°, need not necessarily give rise to alarm, although, of course, we should at all times seek for some underlying cause, and especially if the elevation happens to be repeated. In this connexion it is as well to bear in mind that in infants, when once the heat centre has been disturbed, some time may elapse before it regains its equilibrium, and that slight variations in the temperature may persist for a while after the exciting cause has been removed. On the other hand, a temperature which adheres more or less closely to the normal must not lead us to make light of any other physical signs which the child presents.

The most accurate method of taking a child's temperature, and especially that of an infant, is by the rectum. If for any reason this is undesirable, the thermometer may be placed in one groin and the legs held in a crossed position. Axillary temperatures are unreliable in young

children, owing to the difficulty in keeping the child still and retaining the instrument in position, and the same is even more applicable to mouth temperatures, to say nothing of the danger of the instrument being broken when used in this way. Indeed, the mouth should never be used for taking a child's temperature, as even in the case of older children it is often difficult to make them keep the lips closed and breathe through the nose for a sufficiently long time. The presence of adenoids, moreover, may render such a proceeding impossible.

At birth the temperature of a healthy full-term child is normal or a little above. During the first few hours it falls 1°, 2°, or perhaps 3°, as the result of washing and the change to cooler surroundings. In a short time, however, it rises again to normal, and persists with little variation between 98.4° and 99°, though rectal readings may be a little higher still. As a rule, the evening temperature of a healthy child differs but little from that of the morning, but even in health a difference of 2° or 3° may occasionally be found. In premature infants the temperature is usually several degrees below the normal, owing to their feeble powers of heat production and the absence of subcutaneous fat, which allows a rapid radiation of heat from their bodies. For such children artificial heat is a necessity. The child's temperature should be maintained by oiling the skin and wrapping the body in cotton-wool without any clothing except a diaper. The child should then be rolled in blankets and surrounded by hot-water bottles. At the same time the child must not be rendered unduly hot, and its temperature should be taken every four hours. The room should be well heated and kept free from draughts. Washing such children is inadvisable, except in the region of the buttocks after the passage of excreta, but the skin may be cleansed by an application of olive oil every two or three days. When possible, premature children are best kept in an incubator. This consists of a chamber, at the bottom of which is a heating apparatus, generally a water-tank, which is heated by means of a gas flame. Above this is the air-chamber, in the middle of which the bed is fixed. Fresh air enters by an opening below the bed, and is warmed by passing over the hot-water tank. It then circulates upwards, and passes over the bed to an exit in the top. The temperature of the incubator should be kept at about 85° in the case of very young and feeble infants. Care must be taken that the temperature is maintained at a uniform height, and for this purpose the apparatus should always be fitted with a thermometer. Efficient ventilation of the chamber is another important consideration, and an adequate circulation of air may be secured by keeping the room temperature at a moderate level, and not higher than 60°. The proper ventilation of an incubator is always a difficult matter, and for this reason a frequent watch must be kept upon the patient, and a cylinder of oxygen should be at hand for use in the event of the child becoming cyanosed. When in the incubator the infant, as a general rule, need be only lightly clothed, but the amount of protection required will depend upon individual peculiarities. The intake of a sufficient quantity of food further helps to maintain the body temperature of the patient. Weakly infants, who take badly, consequently require, as a rule, a greater amount of artificial heat. Stimulants also are sometimes necessary if the child's powers are very feeble; 10 to 15 minims of brandy, well diluted in 1½ to 2 drachms of water, may be given every three or four hours.

SUBNORMAL TEMPERATURE.

Chart 1 is that of a premature infant, reputed to have been born after only six months and five days' gestation. The temperature at first was almost uniformly between 94° and 95°, but after a few days in the incubator it rose to from 95° to 96.5°, with occasional excursions to normal. A fortnight later the temperature was mainly between 96° and 98°. The child held its own fairly well for a time, but, as not infrequently occurs in such cases, it died suddenly from no apparent cause. The rectal temperature of such infants is usually 1.5° to 5° below the normal, but if it remains constantly below that range, and sometimes it falls as low as 90°, the outlook is very grave. In cases of disease, as, for instance, epidemic gastro-enteritis, a temperature between 93° and 95° is, as a rule, unfavour-

able, and should give rise to the same anxiety as when the temperature is high. In such cases a low temperature usually means an enfeebled power of resistance, and a

that of adults in certain acute diseases, and to various causes which give rise to fever in children, and which are liable to be overlooked.

In the first place, the temperature of a child may rise from no pathological cause. The thermogenetic centre, as I have already remarked, is in a very unstable and excitable state during early life, and the inhibitory centres have but little control over it. The regulation of heat is, therefore, easily influenced by emotional and other causes. Thus it is not uncommon to find a child's temperature raised as the result of excitement, such as that of a tea-party, and quite independently of anything that the child may have eaten; or certain atmospheric conditions, like the advent of thunder, may upset the thermal equilibrium, and I have not infrequently found that the temperatures of several children in a ward have risen simultaneously from no other apparent cause. The rise of temperature in these cases is merely temporary, and is unaccompanied by any other abnormal signs.

A high temperature in a child should always call for an investigation as to its possible cause.

More often than not the pyrexia is due to some morbid process, and it is only after the exclusion of such that a febrile attack, however transient, should be regarded lightly. In childhood fever is the commonest and often the first sign of illness, so that it is not uncommon to find a raised temperature, it may be for two or three days, before a diagnosis of the cause can be definitely made. The temperature often rises

Chart 1.—Subnormal temperature in a premature infant.

high one a severe degree of toxæmia. The Charts 2 and 3 are those of two infants who died from zymotic diarrhoea. In the first you will see that the temperature was mainly about 96°, whereas in the other there were numerous excursions up to 104°.

Another cause of subnormal temperature in infants is congenital atelectasis. In severe cases the child presents the usual signs of asphyxia, but when the atelectasis is slight the condition is apt to be overlooked. Occasionally one lung may be less expanded than the other, causing the movements of the two sides of the chest to be unequal, but, generally speaking, the respirations are shallow and often irregular; a long pause may be followed by a gasping inspiration, and then the superficial breathing is resumed. On auscultation crepitant râles or patches of tubular breathing on deep inspiration may be heard. Such children are pale and apathetic; they are feeble and "take" badly, and, as I have said, the temperature is subnormal. If the signs persist, and the lungs do not become fully expanded, an insidious form of bronchopneumonia is apt to develop and frequently proves fatal. This may arise and proceed to a fatal issue without any elevation of temperature. These cases must be kept in a warm room, and artificial heat in the form of hot-water bottles is frequently necessary. During cold weather, therefore, an adequate supply of fresh air is a matter of difficulty, but the lack of proper ventilation may in some measure be made up by inhalations of oxygen.

A subnormal temperature is also found in cretins and in cases of hypothyroidism. In the latter the thyroid insufficiency is not so marked as in cretins. They are dull, heavy, backward children, and are below the normal in size and weight. In this class of case the temperature is generally subnormal, and the patient, as is the case in myxoedema in adults, usually complains of abnormally feeling the cold. Under treatment with thyroid the general symptoms improve, and the temperature assumes a normal level. At the same time, young cretins require to be warmly clad and protected from chills, as, owing to their poor vitality, they are liable to succumb to bronchitis or pneumonia. I here show you a chart of a cretin (Chart 4) at the commencement of treatment, and you will observe that the temperature curve is uniformly below the normal line.

Chart 2.—Subnormal temperature in a fatal case of acute gastro-enteritis.

PYREXIA.

I now turn to the subject of high temperatures in children, but I shall not discuss the temperatures of the infectious fevers; they are generally well known. I shall confine myself rather to the differences between the temperature of children and

Chart 3.—High temperature in a fatal case of acute gastro-enteritis.

from comparatively trivial causes, and it is especially liable to do so in nervous children and those who come of a neurotic stock. Malnutrition and unhygienic surroundings, further, have a marked influence in causing elevation of temperature, and more especially if they are associated with symptoms of nervous irritability in the patient.

The exciting pathological causes of fever in childhood I will divide into four main groups:

1. Intestinal Toxæmia.

(a) Of Bacterial Origin.—

This is caused by the ingestion of contaminated food and the subsequent multiplication of the bacteria in the alimentary tract, with the result that acute gastro-enteritis is set up.

(b) Due to Improper Food.—

Thus, in the case of infants, there may be an excess of one or other of the normal constituents of the milk. The proteins, fat, or carbohydrates may be present in a higher proportion than the child can assimilate. Or, again, the infant may be given a dietary

Chart 4.—Subnormal temperature in a cretin, aged 11, at the commencement of treatment.

comprising foodstuffs which are unsuitable for its age and beyond its powers of digestion. In this way acute intestinal indigestion arises. In children who are a little older there is a variety of intestinal dyspepsia called "carbohydrate fever," which is caused by excessive consumption of carbohydrate. In addition to the rise of temperature, the child suffers from general malaise, headache, and loss of appetite. The attacks are often recurrent and yield to a mercurial purge, and the limitation of carbohydrate foods. In other instances defective starch or fat metabolism is met with, and more rarely there is an inability to assimilate proteins. Other digestive idiosyncrasies comprise certain fruits or vegetables, eggs, and even milk, which the assimilative powers of some children are unable to cope with. In infants under the age of 2 years intestinal toxæmia, either acute or chronic, is much the commonest cause of fever, and it is especially liable to occur in children who are artificially fed. The height to which the temperature may rise depends to a large extent upon the age and nutrition of the patient. Broadly speaking, the younger and worse nourished the child is the higher will be the fever, and in bad cases the temperature may run up to 104° or 105°. In early infancy, therefore, any marked rise of temperature which admits of no other immediate explanation, should be attributed to intestinal toxæmia. The bowels should be freely opened and all food withheld for a time. If this is done the temperature usually falls in the course of a day or two. A subsequent rise of temperature may indicate that the fever is due to some other cause, or that the toxæmic condition is severe.

2. General Toxaemia (Bacterial).

This is the most frequent cause of fever in children above the age of 2 years, and it becomes more and more frequent as the child gets older. Rheumatism, pneumonia, influenza, or one or other of the infectious fevers are usually ushered in by a rise of temperature, whatever the subsequent course of the temperature may be. Tonsillitis, whether of rheumatic origin or not, is one of the commonest causes of pyrexia in children, and is often unsuspected. A remittent or intermittent temperature is not infrequently due to tuberculosis, and when such a temperature persists tubercle should always be thought of, especially if there has been some previous affection of the lung. In infants tuberculosis is chiefly of the milary variety, and is very liable to supervene upon bronchitis or bronchopneumonia, but in children over 4 years of age the condition is frequently concealed in the early stages, and the first manifestation may be merely a slight irregular fever, wherever the disease is localized.

The body temperature in certain of the specific diseases differs considerably in children from that found in adults.

Chart 5.—Acute rheumatism in a boy
aged 7.

chart of a case of acute rheumatism in a boy aged 7 years (Chart 5). The initial temperature was from 100 to 101°, and this quickly subsided under the influence of salicylate.

The temperature of pneumonia, again, shows great variations in early life. The disease is a common cause of obscure fever in infancy, and the occurrence of continued pyrexia always calls for a careful examination of the lungs. The detection of lobar pneumonia is some-

times difficult, as the physical signs may not become evident until the third or fourth day; indeed, in some cases the actual evidence of consolidation is equivocal, although it is practically certain that the child is suffering from pneumonia. The general appearance and cyanosis of the patient, together with respiratory distress at the time of the fever, and the rapid amelioration at the crisis, are all characteristic of the disease, and yet there may be no definite dullness on percussion, or anything more than a little harsh breathing to be heard on auscultation of the lungs.

This is a chart of such a case as I have referred to

Chart 6.—Lobar pneumonia without definite physical signs in
a boy aged 2.

(Chart 6). You will notice that the patient, who was aged 2 years, had a very high temperature, reaching on one occasion 105.6°, and that on the seventh day a crisis occurred. Almost immediately after the crisis both the pulse and respiration rates fell. The respirations, which had been 70 twelve hours before the crisis, were 24 eight hours after its occurrence, while the pulse-rate fell during the same time from 162 to 84, though it subsequently increased to just over 100, which is about normal for the patient's age. The occurrence of a slow pulse for a time is not infrequent after the crisis in lobar pneumonia, and this, I am convinced, was what the child was suffering from, though the only physical sign which could be detected in the chest was some impairment of the note at the right base.

In lobar pneumonia the typical continued pyrexia with a crisis about the seventh day is at times met with in childhood, but more frequently, perhaps, the temperature tends to run an intermittent course, as shown in Chart 7, which is that of a case of apical pneumonia in an infant aged 2 years. This chart also illustrates the fact that in some cases the fever is considerably prolonged, and the crisis does not occur until the end of the second week, or later. In this instance there was a pseudo-crisis on the seventeenth day, but the temperature did not finally reach normal until the nineteenth. Chart 8, also of an apical pneumonia, is an example of continued pyrexia, but here again the crisis was late, and did not occur until the twelfth day. Cases of abortive pneumonia, likewise, are not uncommon. Here is a chart which shows the crisis on the fourth day (Chart 9). Those cases in which the fever is prolonged generally afford evidence that the lesion is spreading from one portion of the lung to another, or that the other lung has become involved. There are, however, very puzzling cases, of which I have come across a certain number, which show periodical rises of temperature for many weeks. On the affected side of the chest some impairment of the percussion note with weak or harsh breathing, and perhaps a few crepitations, persists, and one naturally suspects that an empyema may be present. After repeated exploration of the chest in such cases, however, I have never been able to find any pus, and after a variable time the temperature ceases to rise again, and the

patient makes a good recovery. This is the chart of a case of basal pneumonia in a child aged 2 years and 4 months (Chart 10). You will notice that there was an initial continued fever with a crisis during the second week. Subsequently, at intervals of two or three days, the temperature rose again for short periods, reaching at times 104° . In the fifth week there was high fever for six days; this subsided by crisis, and the temperature did not

evidently had pneumonia some weeks previously. From this she had never really recovered, and the history suggested that an empyema had been present all the time. You must remember, therefore, that a normal temperature does not necessarily put a suppurative effusion out of court.

Bronchopneumonia and bronchitis likewise give rise to temperatures which vary considerably. In the former the

Chart 7.—Right apical pneumonia in a girl, aged 2, admitted on the eighth day of the disease; intermittent temperature; crisis on the nineteenth day.

rise again. No physical signs could be found in the chest to account for these periods of pyrexia, and no empyema was present. The child eventually recovered. These are probably cases of indolent pneumonia, but until paracentesis is performed it is impossible to exclude the presence of pus.

This naturally leads me to say something about empyema itself. In a typical instance, when this condition follows an attack of pneumonia, the temperature

temperature is as a rule somewhat lower than in lobar pneumonia, and it frequently takes on a remittent or intermittent character. In other instances there is scarcely a rise above the normal. Here are charts of three cases, all of which presented definite signs of bronchopneumonia, and you will observe that the temperature curves are very different. In Chart 12 the temperature was high, and not unlike that of lobar pneumonia; there were, however, some definite remissions, especially

Chart 8.—Right apical pneumonia in a boy, aged 3½, admitted on the sixth day of the disease; continued pyrexia; crisis on the twelfth day.

Chart 9.—Abortive lobar pneumonia in a boy, aged 4, admitted on the third day of the disease; crisis on the following day.

begins to rise again within two or three days of the crisis, the physical signs of a pleural effusion develop, and the diagnosis is easy. When, however, empyema is a complication of pneumonia, the temperature frequently affords no indication of its presence. It is necessary to rely on the physical signs alone, and they are often misleading. Again, if a purulent effusion has been present for some time, there may cease to be a febrile reaction, and the temperature chart may be perfectly normal, as the one I now show you (Chart 11). In this case the patient had

towards the end of the fever. Chart 13 is an instance of intermittent pyrexia, the temperature on the whole being much lower than in the last, while in Chart 14 after the first evening there was scarcely any rise of temperature at all. In this class of case it must further be noted that the fever is at times by no means commensurate with the physical signs in the chest. I here produce charts of two cases of bronchitis in infants (Charts 15 and 16). The one with the high temperature, reaching 103° and 104° , had scarcely any physical signs, whereas in the other,

which does not show a rise above 100°, except on admission, the chest was full of râles and other moist sounds.

3. Autointoxication (Non-bacterial).

Under this heading I include uraemia, acidosis, and

unconscious, and for a time after consciousness had returned she was quite blind. It was one of those interesting but rare cases in which temporary amaurosis is associated with severe convulsions. A certain degree of fever also occurs at times in cases of tetany. In delicate and

Chart 10.—Basal pneumonia in a girl aged 2½; repeated elevations of temperature during six weeks; no empyema; recovery.

other intoxications. In uraemia it is not uncommon to find the symptoms accompanied by a rise of temperature, and in acidosis there is usually some fever. Acidosis, or acetonæmia as it is sometimes called, gives rise to the cyclical vomiting of children, and is associated with an

acid intoxication by bodies of the acetone group (β -oxybutyric acid, diacetic acid, and acetone). It is also found in diabetic coma and in delayed chloroform poisoning.

4. Obscure Causation.

Lastly, there are certain obscure causes, some of them

nervous children, again, it is not uncommon to find the temperature raised during the later part of the day as the result of fatigue from over-exertion. In such cases the temperature may reach 100° F. or 101° F., and subside after a few hours.

Mechanical or reflex irritation likewise may give rise to fever, the commonest being the cutting of a tooth and the presence of intestinal worms, especially in nervous and ill-nourished children. Parasites frequently cause sudden pyrexia, which may be transient or persist for several days. They often produce no subjective symptoms, but if there is any complaint of abdominal discomfort or anal irritation, their presence should always be suspected. Constipation and undigested food or foreign bodies in the alimentary canal are also liable to cause slight elevations of temperature.

Inanition fever was described by Holt. The temperature rises usually from the second to the fourth day of life, apparently owing to the fact that the infant gets very little milk from the mother's breast. Coincident with the fever, the child presents a loss of weight and considerable prostration and restlessness. The skin is dry

Chart 11.—Normal temperature in a case of empyema of long duration in a girl. A, Operation.

not uncommon, which give rise to pyrexia. Several of these belong, strictly speaking, to the first two groups, but I have preferred to classify them together, as they are liable to be overlooked.

Muscular activity is always accompanied by the production of heat, and in infancy and early childhood may be the cause of slight elevations of temperature. This is most noticeable in cases of convulsions, when the temperature at the end of an attack may be higher than before. Here is a chart showing a rise of temperature for more than two days as the result of convulsions. (Chart 17.) The child was admitted in a state of general convulsions, and for twenty-four hours passed from one fit into another. The temperature rose to 100.2° F., but did not regain the normal level until forty-eight hours after the convulsions had ceased. For several days the child was

Chart 12.—Bronchopneumonia in a boy aged 2½; high temperature with remissions.

and hot, the pulse weak, and the child sucks vigorously anything within its reach. In these cases the temperature may rise to 104° or higher, but if the child is artificially fed, or even given plenty of water to drink, it

rapidly falls, and often does not rise again. As soon as the normal level is reached the child begins to put on weight, and the general symptoms quickly subside. A similar pyrexia is occasionally met with in older infants when the mother's secretion fails, or if fluid food and water are withheld on account of some gastric disturbance. As in

Chart 13.—Bronchopneumonia in a girl; intermittent temperature.

the newborn, the condition promptly reacts to the same line of treatment.

Heat Stroke.—In young children considerable rises of temperature to 105° or 106°, or even higher, may be the result of heat stroke or exposure to excessive heat, or they may be produced by the application of artificial warmth used to augment a deficient body temperature. In the

Chart 14.—Bronchopneumonia in a boy aged 2½; low temperature.

latter case the pyrexia quickly subsides as soon as the hot-water bottles are removed. For this reason it is important that the temperature of delicate and feeble children should be taken frequently, a point which I have previously insisted upon when speaking of incubators. In hot weather, cases of diarrhoea with high temperature may be caused by the sun's heat apart from contamination of the food.

Sepsis.—Another cause of pyrexia in early infancy usually gains an entrance

through the umbilical cord. During the second week of life continuous fever, which is not due to some intestinal disturbance, is usually caused by umbilical infection. It is naturally an occurrence of considerable gravity, and demands immediate treatment.

Otitis media, in children who are a little older, is a common but frequently unsuspected cause of fever, and it is all the more liable to be overlooked as not infrequently it is unaccompanied by pain. In all cases of unexplained fever in early childhood, therefore, an examination of the ears should never be omitted. When the condition is associated with earache the child usually shows evidence of pain and gives some indication that the ear is at fault. The temperature in these cases is extremely variable; it may rise to 104° at one time of the day, and at another not be above normal. As a general rule the temperature falls, and the symptoms, if any, are relieved after perforation of the tympanum and escape of the pent-up pus. The *throat*, also, is often the source of obscure pyrexia, and should always be examined. Tonsillitis has already been referred to as a cause of fever which must not be forgotten, and retropharyngeal abscess is a condition which is especially liable to escape detection unless a careful search is made.

Pyelitis or pyelo-cystitis is a somewhat rare, though by no means unimportant, cause of pyrexia in infancy and early childhood. The temperature in this disease is irregular, and at times high. Its origin is very frequently overlooked, as there are few or no signs pointing to the urinary tract, and the constitutional symptoms are often not severe, although occasionally there may be repeated chills. An examination of the urine, however, reveals a considerable amount of pus, together with vesical epithelium and casts. In acute cases blood and renal epithelium may be present as well. The colon bacillus is frequently present in pure culture. The urine is usually acid, and the treatment consists for the most part in

the administration of alkaline diuretics and antiseptics. A milder form of *B. coli* infection, resulting in bacilluria, may also be the cause of rises of temperature at night. Here are the charts of a case of pyelitis in a girl, aged 5 years (the patient is usually a female), who had rises of temperature at intervals for over five weeks (Chart 18). If you look at the records of the urine you will find that the febrile attacks corresponded with the reappearance of pus or albumin. The child seemed to be perfectly well in herself the whole time, and the renal condition eventually subsided with treatment.

In a single lecture it is impossible to describe in detail all the causes which give rise to fever in children. I have said nothing about the acute specific fevers and many other infections, such as poliomyelitis. I have not touched upon the rises of temperature in purpura haemorrhagica, nor upon the periodical exacerbations which occur in the various forms of anaemia. I have contented myself with pointing out some of the chief peculiarities of the body temperature in children and certain causes of fever which are liable to be overlooked, and I will conclude this

Chart 15.—Acute bronchitis in a child aged 1; high temperature; very few physical signs.

part of my subject with one or two general observations. The first is this: Speaking generally the temperature is higher in children than in adults from a corresponding cause. There are exceptions, however, as I have pointed out, such as acute rheumatism and some instances of bronchitis and pneumonia. The second point upon which I wish to lay stress is that children may have a high temperature and yet not have the appearance of being

Chart 16.—Acute bronchitis in a girl aged 4; low temperature; copious physical signs.

Chart 17.—Elevation of temperature due to convulsions in a girl aged 4.

very ill. As an example of this I will again cite pneumonia. It is of common occurrence to see an infant sitting up in bed and playing with its toys (it is often very difficult to make the child lie down) with a high temperature and consolidation of the whole of one or more lobes of the lung, a condition which in the adult would give rise to extreme prostration. Further, I would remind you that it is easy to be deceived as to a child's temperature by mere tactile sensation. At times the skin is hot, and the child is obviously feverish, but frequently the body gives

no marked sensation of heat, and yet the temperature, when taken by the thermometer, is higher than one expected. Whenever, therefore, a child seems in the least

cold is liable to cause a subnormal temperature. Its use, therefore, should, as a general rule, be restricted to rather older children.

Chart 18.—Pyelitis in a girl aged 5. A, indicates the presence of albumin ;
P, that of pus in the urine.

out of sorts, the temperature should be taken as a routine measure.

TREATMENT.

In the first place, a child whose temperature is raised should be put to bed and be lightly but efficiently clothed. Plenty of fresh air may be allowed, but at the same time precautions must be taken to protect the patient from draughts. In hot weather a bed-cradle may be used to keep the weight of the bedclothes off the child's body, and thus add to its comfort. As a general principle the treatment should begin with a purge. A small dose of calomel, followed by castor-oil, is nearly always beneficial. It not only clears out the intestinal tract, but also serves to reduce the fever, whatever may be its cause. In cases where the alimentary tract is involved special attention must, of course, be paid to such symptoms as constipation, vomiting, and diarrhoea, but even when some other part is at fault the excretory functions must always be regulated by appropriate means.

Various methods may be undertaken in order to reduce the temperature, but as a general rule these should be deferred until a diagnosis of the case has been made, unless the child is extremely restless or shows other signs of distress. It is the course rather than the height of the fever which aids in making a diagnosis; hence it is advisable not to employ antipyretic means too soon. Of the methods to be employed for the reduction of temperature when the patient shows signs of restlessness or distress, the *bath* is the safest and the most efficacious. Older and sturdy children may be immersed in a cool bath at about 80°, or the temperature of the water may be gradually lowered from 100° by the addition of ice. The body and head should be freely sponged, and after five or ten minutes the child should be quickly dried and wrapped in a warm blanket. Young children and infants, however, especially those who are weakly, do not stand cold water well, and the same applies to the cold pack. The shock to the nervous system is too great, and harm or even death may ensue. For such a warm or tepid bath should be employed at a temperature not lower than 90°. If for any reason a bath is impracticable or inadvisable, sponging with tepid water, or equal parts of alcohol or vinegar and water, may be used. An alternative method is that of evaporation. The body is loosely wrapped in one or two layers of gauze, which is moistened from time to time with water at 115°, evaporation all the while being promoted by means of a fan. The feet at the same time should be kept warm by the application of hot-water bottles. This may be continued for a quarter or half an hour. By these means the body temperature is reduced, often to a marked degree, and the nervous system is soothed. Frequently, too, the child rapidly falls into a refreshing sleep. In cases of continued fever, or where there is evidence of meningitis, an ice-bag lightly applied to the head is of value, but this, again, must be used with caution in the case of infants, as the continued

of potassium or magnesia and liquor ammonii acetatis. For older children this may be made to effervesce; it is palatable, cooling, and helps to check the thirst. As a rule the patient may be allowed to drink freely, and in the case of infants suffering from diarrhoea infusions of normal saline solution under the skin are of great benefit.

Diet.—In the case of infants milk should be withheld and albumin water alone be given for twenty-four or thirty-six hours at least, as in them intestinal toxæmia is the commonest cause of fever, and must either be treated or excluded before the child is allowed to return to a milk diet. For children above 3 years of age a fluid diet, consisting largely of milk, should be ordered. As a rule the food should be given cold, and, if there is vomiting, it may be iced. In respiratory diseases, however, it is often best to give the food slightly warmed, and in cases of collapse hot milk acts as a useful stimulant. Regular feeding in cases of prolonged pyrexia is a necessity in order to maintain the patient's strength, but, if possible, feeding should take place during a remission of the temperature; at other times only water or stimulant in the form of alcohol should be given. It is essential that the patient should not be awakened from sleep in order to be fed, unless there is excessive drowsiness or stupor, in which case the child must be roused at intervals, as otherwise sufficient nourishment will not be taken. In transient fevers children may go without food until the temperature falls, though water may be given freely. Prolonged pyrexia, on the other hand, is debilitating, and requires generous but careful feeding.

OFFICIAL statistics show that the total number of students of medicine in 1914 in all the medical faculties of France is 8,533, of whom 6,765 are Frenchmen and 899 foreigners, and 869 women, of whom 469 were foreign. The medical schools had 1,512 students on their books; of these 1,246 are Frenchmen and 47 foreigners, and 219 women, of whom 213 were French. The number of students shows a slight increase; the proportion of women and foreigners remains as it was in 1913. Paris heads the list with 4,397; Lyons comes next with 1,181; then come Bordeaux (887), Montpellier (702), Toulouse (462), Nancy (325), Lille (377), and Algiers (202).

The committee formed in memory of N. I. Pirogoff by the Russian Medical Society for the Study of Malaria in Russia is at present engaged in preparing a catalogue of Russian literature on the subject up to the end of 1913 inclusive. In future it is proposed to issue similar catalogues annually with short abstracts of papers that have appeared in the course of the year. The committee also intends to publish brief compendiums on leishmaniasis, piroplasmosis, and other protozoic diseases. An appeal is made to authors of writings on related branches of medicine, veterinary science, and phytopathology to send copies to the Committee. The president of the committee is Dr. E. Marzinowsky; the official address is Bibl. der Pirogow. Malar. Kommission, Powarskaja 10, Moscow.