know when this is going to happen; and it is therefore seldom safe to order less than the three months' course from the date of the last relapse.

The comparative virtues of the various cinchona alkaloids and their salts and of different modes of administration cannot be dealt with here; and discussion of the best means of treating the rare intractable cases would also be out of place, though I must repeat that in my opinion such are due to natural or acquired quinine resistance in the host and not in the parasite. It is a misfortune for the whole Empire that, in spite of the loss of millions of pounds over the Salonica malaria, more investigation on such points is not now being carried on. But our Governments are incorrigible on the subject of research.

With regard to continuous medication in other infections, it appears to me probable that the quick cures which are often reported (especially in spirochaete infections) are really due chiefly to the patient's parasitocidal bodies, to which the curative drug only adds the finishing touch. We may possibly, however, find drugs which possess more marked reduction rates (for multiplying parasites) than those shown in the table. At our clinic many of us have had very encouraging results as regards intestinal amoebae from a form of continuous medication with ipecacuanha suggested by Colonel Drake-Brockman, and similar to that which we employ in malaria. I give from 3 to 10 grains of powdered ipecacuanha in pill, without any adjuvant, on an empty stomach at bedtime every night for months without fail. Others give the drug in powder or cachet, or add small doses of Dover's powder. The principle involved seems to be the same as that which I have endeavoured to indicate, as briefly as possible, in this paper.

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ON CHRONIC NASOPHARYNGEAL INFECTION, CHRONIC TOXAEMIA, AND DISTRESSED HEART IN CHILDREN.*

BY

C. PAGET LAPAGE, M.D., M.R.C.P.,

LECTURER IN DISEASES OF CHILDREN, MANCHESTER UNIVERSITY;
PHYSICIAN TO THE MANCHESTER CHILDREN'S HOSPITAL,
PENDLEBURY; AND TO ST. MARY'S HOSPITAL,
MANCHESTER.

Nobody will dispute the statement that nasopharyngeal infection is a very common trouble, especially in manufacturing districts; and that, though it is often acute and obstructive in nature, it is also very often present as a chronic infection with catarrhal rather than obstructive signs. The points which I wish to bring to notice are:

1. That this chronic infection of the nasopharynx serves as one of the most important foci from which organisms may generate toxins which cause a chronic lowered state of health in the child.
2. That the nasopharyngeal infection may be due to different kinds of organisms, the influenza bacillus being an especially potent factor and often acting as the initial infecting agent, though it may not remain in the nasopharynx.
3. That this toxæmia often gives rise to heart lesions, and that, though these heart lesions may be valvular, they are often of quite a different nature from valvular lesions—that is, they are more in the nature of nervous irritation than of inflammatory troubles affecting the heart.
4. That these special forms of heart trouble need methods for diagnosis which are not usually employed, while they also need different treatment from that usually prescribed.

Chronic Nasopharyngeal Infection.

Such cases may be either obstructive or merely catarrhal. The obstructive ones are easy to recognize. The catarrhal cases are, however, often overlooked if a careful history is not taken from the parents. The child has not necessarily adenoid facies, but has a history of chronic catarrh, of frequent colds and of a running nose, while on making an

examination mucus may be seen dropping from the nasopharynx. The tonsils may not be enlarged. Another point is that the glands behind the ear are often enlarged; these are the highest of the posterior cervical glands and less commonly the posterior auricular glands. It is an interesting point because it shows which glands drain the nasopharynx.

Chronic Toxaemia.

It is a commonplace that a septic focus may give rise to chronic toxæmia; dental caries and chronic gastrointestinal infection are the two examples which occur at once. The nasopharynx is another situation from which infective trouble may cause a very definite toxæmia. The symptoms are: pallor, which may often be very marked indeed; darkness under the eyes, especially on getting up in the morning; pains may occur which can best be described as those usually known as "growing pains." These are said to be especially associated with rheumatism, but they are to my mind quite as often met with in the chronic toxæmia of nasopharyngeal infection due to various organisms.

Amongst other general signs we meet with slackness of the ligaments, especially those which are subjected to strain in a growing child, the spine, and the arch of the foot; in this way scoliosis, or general round-shouldered carriage, may occur, or flat-foot may make its appearance. The extremities easily become cold; the pulse becomes rapid and very easily disturbed in rhythm. There may be anaemia in addition to pallor. The heart signs and symptoms I shall describe later. The thyroid gland is not uncommonly a little enlarged. Enuresis is sometimes a symptom.

The nervous system, next to the heart, shows the most important symptoms and signs. The child often has bad headaches and is irritable and nervous. The mother says that the child's disposition has changed, and that he or she has become peevish, moody, or lackadaisical, and in some instances very depressed. Disturbed sleep is also common. If the child has a vivid imagination, all sorts of morbid ideas may occur. And of course, as one would expect, children of the neurasthenic type, who are those who have been endowed with a nervous system which feels the stress and strain of life, are the first to give out the above signals of distress when any lowering agent such as toxæmia makes its appearance.

Tic or habit spasm is common. It is necessary to make a clear distinction between this and chorea. Chorea is generalized and indiscriminate in that sudden and diverse movements of practically any part are provoked. In tic, on the other hand, there is a peripheral stimulus which acts on the excitable nervous system, and finds expression in a constant repetition of one particular movement. The spasm may affect one group of muscles, or, later on, change to another group.

The common forms of tic are: (1) blinking the eyes; (2) contorting the mouth (I have known cases punished in school for pulling faces where in reality they have had tic); (3) drawing the head round to the shoulder; and (4) constant clearing of the throat. This last may, of course, be present in a child who really has mucus at the back of the throat.

Chorea is a rheumatic manifestation, and is not a common accompaniment of nasopharyngeal toxæmia; on the other hand, tic or habit spasm is. In association with this I should mention the differential diagnosis between rheumatism and toxæmia. The term "rheumatism" has come to be used too loosely in relation to disease in children; it has often been used to give a name to cover a variety of symptoms, just as influenza is a convenient diagnosis when there are no clear indications as to the cause and nature of acute illness. To my mind the term rheumatism should at present be limited either to (1) the acute cases with hyperpyrexia, with joint inflammation; or to (2) those with throat trouble and chorea and morbus cordis; or to (3) those with subcutaneous nodules and, as often happens with these nodules, very acute and rapid valvular disease and heart failure.

The organism which causes acute rheumatism may cause chronic toxæmia, and no doubt it often does; but there is no doubt that other organisms may give rise to the signs and symptoms of chronic toxæmia, therefore these signs and symptoms should not be labelled as rheumatic.

* An address, the substance of which was delivered to the Bolton Medical Society on December 7th, 1920.

Irritable or Distressed Heart.

Heart trouble may be either (1) actual inflammatory trouble, which gives rise to endocarditis, pericarditis, or myocarditis, or possibly a combination of all three; or it may be in the nature of (2) loss of tone of the muscle with toxæmia, but without actual infective inflammation; or it may be (3) irritability due to disturbance of the nervous supply. Now, though infective trouble of the heart together with inflammatory disease of valves or surfaces may arise as a result of nasopharyngeal infection, it is not my purpose to deal with it here. We shall, therefore, consider only two classes of heart trouble, which I shall name as (1) the muscle-relaxed heart (the lax heart), and (2) the nervous, irritable heart (the tense heart). Neither of these gives rise to bruits or to dilatation which is easily discernible by the ordinary methods of palpation, percussion and auscultation. The pulse in the lax heart is slow, but quickens abnormally with exercise, while the pulse in the irritable heart is always beating rapidly, and reacts especially to emotion and mental stress; but—a very important point—it may be slowed by exercise.

Differential Diagnosis.

Before we diagnose toxæmia following nasopharyngeal infection we must be careful to exclude other conditions and other toxæmias, and such a differentiation is often a matter of considerable difficulty. First, non-infective conditions may give rise to signs and symptoms of the kind I have mentioned. These are—bad hygienic conditions (which include constant underfeeding or unsuitable feeding), loss of sleep, crowded conditions of living, and mental stress. This is the lot of many children at the present time. A physician who has seen a worn-out child at the out-patient department, and then seen the extraordinary improvement which a few days in bed in hospital may effect, will realize this. In fact, such a rest is valuable as a means of prognosis, because the marked improvement following good hygiene shows that the trouble is non-infective.

Another condition is cyclical albuminuria. This will give rise to pallor and debility, while the presence of albumin may only be detected by frequent examination of the urine. Amongst infective conditions are oral sepsis and chronic ear discharge, and other forms of infection which may be associated with the nasopharyngeal trouble. There is, however, a more important form of infection which gives rise to chronic toxæmia—more important because it is less obvious—and that is tuberculous infection of the lymphatic glands, thoracic or mesenteric. The following case illustrates the difficulty, and the means of diagnosis.

Boy, A. H., aged 6 years.

This boy was brought to me in May, 1919, with a history of having had an attack of influenza in 1918. He had not been well since. He had had no appetite, had had one slight attack of influenza since, and had also had an attack of acidosis. On examining him I found that he had slightly enlarged tonsils and adenoids, and I made a note that the chest was suspicious of tuberculosis—that is, it was thinner than usual and showed a slight outgrowth of downy hair, but that it showed no definite physical signs of any kind which pointed to tuberculosis. Apart from this the boy presented no signs of illness, except that his heart rate increased too rapidly in response to exercise. His symptoms were those of tiredness, debility, and pallor. I said that he might have to have his tonsils and adenoids removed, but recommended a change to the seaside. He was away for two months, and when he came again in August he was very well; the tonsils had diminished. In October, however, his troubles had returned. His tonsils were now slightly enlarged; he had disturbed nights, and the heart was again rapid after exercise; he went away again and once more improved in health. But he could not keep up his health at home, and did not react so well to the change as he had done previously. He now showed more evidences of strain and more marked pallor, and the darkness under his eyes. I asked his medical man to examine the urine frequently at different periods of the day, and after producing an artificial lordosis; but there were no signs of any albumin. We then examined his chest by x rays for enlarged bronchial glands and found definite evidences of tuberculous infection, though the lungs were not affected. His chest still showed no physical signs, except that D'Espine's sign was now present, the whispering pectoriloquy to 333 being heard as low as the third dorsal spine.

This case shows very well many of the points of the differential diagnosis between chronic nasopharyngeal and tuberculous toxæmia, which are as follows:

1. *History.*—An attack of influenza may be the starting point of either trouble, but if anything is more likely to be

a precursor of nasopharyngeal infection. Colds are a common feature of both, though here again they are more marked in nasopharyngeal infection. The opportunity for infection with tuberculosis is of importance. If there is anyone in the house who is suffering from tuberculosis, the likelihood of tuberculous infection is, in my opinion, very great indeed.

2. *Symptoms.*—Breathlessness, pallor, chronic lassitude, are equally common in both; but growing pains and headaches are more likely in nasopharyngeal infection. Cough may or may not be present in both. In glandular tuberculous trouble the cough may be brassy, while that of nasopharyngeal infection may be either in the form of tic or habit spasm, or an irritating cough from the throat, due to mucus dropping from the nasopharynx.

3. *Signs.*—Slight rises of temperature may occur in nasopharyngeal toxæmia, but they are not nearly so noticeable nor so constant as those which occur in tuberculous toxæmia. Even the latter need careful observations for their detection. Night sweats, if present, point to tuberculous trouble, and so does wasting. The skin shows a loss of tone in both conditions, but it is not usually very great in nasopharyngeal toxæmia. In tuberculosis, however, the skin may show very marked changes; there is a great loss of tone, wasting, and often a marked dryness, together with the downy outgrowth of hair. The best description I can give to it is that it resembles the surface of dirty and rather dry dough. If anything, laxity of ligaments is more marked in nasopharyngeal trouble. Tic, growing pains, and irritable heart are not often seen in tuberculosis, but are quite common signs in nasopharyngeal infection.

The local conditions of the nose help us considerably in diagnosis, while an examination of the chest may show physical signs, though in most cases it does not. I should like to mention here that nasopharyngeal obstruction can give rise to interrupted breathing of quite marked degree in the upper lobes, especially if the child, being on its best behaviour, tries hard to keep its mouth shut and breathes through its nose during the examination. It is often a good plan to tell the child to breathe through the mouth while listening to the chest.

D'Espine's sign is valuable though not conclusive: the child is asked to whisper "three—thirty—three," and the stethoscope is applied over the spines of the lower cervical and upper dorsal vertebrae in turn. Normally no definite pectoriloquy should be heard below the first or second dorsal vertebra; but with enlarged bronchial glands the increased pectoriloquy may be heard as low as the third or fourth or fifth dorsal vertebra. The x ray examination shows us very definitely whether tuberculous glands are present, and it often gives an indication as to whether the tuberculous infection is quiescent or active; it also indicates the state of the heart. The Von Pirquet skin reaction can be tried. It is specific, as showing whether the child has had a tuberculous infection or not, but it does not necessarily prove that the disease from which the child is suffering at the time of the reaction is tuberculous. The reaction may be the acquirement of the child as a result of an old and healed tuberculous lesion.

The effect of treatment helps us to some extent in differential diagnosis. Rest and feeding will improve the tuberculous child more than one with nasopharyngeal trouble. Sodium salicylate improves the latter, and creosote with cod-liver oil the former. A change, especially to the seaside, improves both; but the child with nasopharyngeal infection shows the more striking results, because its amelioration depends more on climate. Much can be done for tuberculous infection by home treatment in the way of rest and open air, but removal from home atmosphere is often essential for nasopharyngeal infection. Finally, it must be noted that tuberculous infection has, as one of its most important early signs, nasopharyngeal catarrh, and that a combination of the two infections may occur.

Nature of Organism in Nasopharyngeal Infection.

Dr. Sellers, Pathologist to the Manchester Children's Hospital, examined nasal swabs from sixty-three of my cases. He found many different kinds of organisms, but no one kind occurred with great frequency. Diphtheroid organisms occurred in twenty-one, but, tested in five instances, they were found to be non-pathogenic to guinea-pigs.¹ The influenza bacillus was not often found in the swabs examined,

but an inquiry into the history of these cases showed that an attack of influenza was often the starting-point of the trouble. I have found this history so often that I am convinced of the potency of the effect of an attack of influenza in setting up a chronic catarrh of the nasopharynx. In this connexion we must remember the epidemic of 1918, and I am quite convinced from my experience that there has been a great increase of these cases of chronic nasopharyngeal toxæmia with tic and irritable heart since that time. The bacillus of influenza may not remain in the nasopharynx, but it has done its damage. It has set up chronic inflammatory mischief and it has lowered the resistance of the nasopharyngeal mucous membrane to other infections, and any other organisms are enabled to grow and multiply.

Treatment.

If there is nasopharyngeal obstruction, operation is needed; if not, local treatment of the nasopharynx should be tried. The nasopharyngeal toilet in children is not very easy, but with an intelligent child a good deal can be done in the way of douching and spraying. More important, however, are physical exercises and drill, which are directed to keeping the nasopharynx clear. I have seen great benefit from persistent treatment on these lines.² The value of change of climate has already been referred to, and this, when available, is perhaps the most important of all; but it is not easy for most children to have prolonged residence at the seaside unless they happen to be of boarding-school age and can be sent to a seaside school. The question of drugs can be summed up by saying that sodium salicylate is the most useful for the infection and toxæmia, followed by tonics in the form of either nuxvomica or iron.

The treatment of the heart troubles is very important, and it is necessary to make a clear distinction between two forms: (1) The lax heart, and (2) the irritable (tense) heart. The lax heart needs a period of rest to recover from any dilatation which may be present, and then graduated physical exercises until tone is restored. The irritable heart is, however, quite a different matter; there is no dilatation, but only a very rapid pulse, which is stirred up especially by emotion and may be slowed by exercise. Dr. B. A. McSwiney, of the Physiological Department of Manchester University, and myself have been working lately at a series of tests—physical, emotional, and also one related to intrathoracic pressure—by which we hope to be able to evolve simple clinical methods of distinguishing between these two forms of heart disease. These tests are based on similar lines to those which Dr. Martin Flack has described with regard to testing candidates for the Air Force.³

The x-ray screen examination is also very useful, and the two varieties of heart trouble can be readily distinguished when looked for. The slow-beating heart, slightly dilated to the left, with an increased width from side to side at its lower part, shows up very clearly in comparison with the extremely rapid, and one might also say contracted, heart, which appears to be almost as wide in its upper part as in its lower. In this latter case it is quite obvious that, since the heart is not dilated, it is not necessary to treat the child by prolonged rest; this was shown during the war, when "disorderly action of the heart" was found to be improved by a series of drills and exercises. The trouble in these cases is that emotion and nervous control play a very large part in their production, and if the child can be taken out of itself and at the same time given suitable exercises the trouble will tend to disappear gradually. One must remember, however, that it is possible for dilatation to be superimposed upon irritability; in such cases a period of rest may be necessary before commencing the exercises. The point, however, is that some cases of heart trouble in children should be treated, not by rest, but by physical exercises.

I have arranged, in the massage department of my clinics, to have selected cases of irritable heart disease treated in this manner, and so far the results have been very encouraging. The children are set to play games which keep them fully engrossed, and if a little ingenuity is exercised this object can be attained.⁴

Prognosis.

This depends very much on whether treatment is continuous and thorough and on the lines recommended. I

do not remember having ever seen valvular disease of the heart develop in any of the cases of purely irritable heart with which I have had to deal, though I have seen it develop after lax heart when rest was not persisted in. In conclusion, I wish to state once more that the ordinary methods of palpation, percussion and auscultation are not sufficient to diagnose these cases, and it is therefore necessary for us to adopt more delicate methods of estimating the heart efficiency by tests such as I have indicated.

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REMOVAL OF STONES FROM THE PELVIC PORTION OF THE URETER.

BY

W. H. BATTLE, F.R.C.S.,

CONSULTING SURGEON TO ST. THOMAS'S HOSPITAL.

THE operations described in textbooks for the removal of a stone from the pelvic portion of the ureter, are nearly all devised with the evident intention of avoiding any interference with the peritoneum. Stones have been taken away successfully by direct incision of the ureter from the intraperitoneal aspect, followed by closure of the opening with sutures, but this, as a routine method, has not yielded the good results recorded where the extraperitoneal operations have been practised. There has therefore been, and is still, a tendency to avoid using the peritoneum in any way as a regular part of such a procedure.

The following methods are the chief of those recognized at the present time¹—it is not necessary to describe them:

A. Extraperitoneal—

1. Exposure of the lumbar segment of the ureter.
2. Exposure of the whole length of the ureter.
3. Exposure of the ureter at the brim of the pelvis and in its pelvic portion.
4. Para-sacral route for exposure of the pelvic segment.
5. Vaginal route.
6. Vesical route for calculi in the intramural portion of the ureter.
7. Transvesical route for calculi lying in the lower two inches of the ureter outside the bladder wall.

B. Transperitoneal—

Exposure of the ureter at the brim of the pelvis and in its pelvic segment.

Advantages of an Opening into the Peritoneum.

There have been manifestations of a tendency to use the intraperitoneal route to some extent during recent years. For instance, Dr. Witherspoon² opened up the peritoneum to localize the stone, then sewed up the opening in the peritoneum very carefully. He afterwards peeled the peritoneum off the parietes, so as to enable him to extract the stone extraperitoneally.

Dr. Gibbon, of Philadelphia,³ pointed out the advantages of combined intra- and extra-peritoneal uretero-lithotomy—"for doubtful cases and all cases where a stone is found in the ureter when the abdomen has been opened for some other condition." He records two cases in which stones were removed from the lower part of the ureter, having been found during exploration of the right iliac fossa. In both the appendix was removed and then the stone extracted through an incision made extraperitoneally.

Recent Opinions.

Mr. Kidd, when introducing a discussion at the meeting of the British Medical Association last year, advised an extraperitoneal operation, but conceded "that if anything can be gained it is permitted to open the peritoneum." In the discussion which followed that paper Mr. Grey Turner said that he thought it "advantageous to open the peritoneal cavity simply for the purpose of locating the stone