The treatment is directed against the morphine or other habit, in which the craving for the drug is so strongly reinforced by the slightest demand for the relief of pain, sleeplessness, etc., that it appears impossible to resist it. The treatment removes this craving, and if the disorder is functional, the bromide rest, the changed dietary, the cutting off of all ordinary surroundings more completely than is possible by other means, may not be without beneficial effect on the pain, etc. For those in whom other treatment has failed, and for all who are willing to submit to this method, it offers what appears to be a certainty of deliverance from the craving without suffering, which is more than can be said of any other method of treatment of which I am aware. By the time the patient has become capable of making the drug which has caused the habit the object of thought, it has actually become dissociated from his comfort, and the new relationship a matter for astonishment.

That this use of the bromide may prove beneficial in other maladies is suggested by two other cases. In one of these, a lady 48 years old, suffering from an attack of acute mania occurring in a Japanese hotel in the interior of Japan, where the sounds from the other inmates, drove the patient frantic. Without forcible restraint, a two days' journey by hammock and boat would have been impossible. In the bromide sleep all irritation from light and sound ceased, but, as no assistance could be had in nursing the patient through such an illness on the spot, in this sleep she was carried twenty miles in a hammock swung on two chair poles, lay asleep on the deck of a small steamer for several hours, spent a night in another Japanese hotel, was put on board a steamer, carried 500 miles, and placed in her own bed in her own house, where she awoke two or three days later none the worse for the journey. She passed through stages similar to those already described, and, when the effect of the bromide passed off, there was not a trace of mental disturbance, and she is still well over a year later. The part played by the bromide in securing sleep and rest amid such surroundings, and the aid to transportation were sufficient in my opinion to justify its use. How far its effects had to do with the rapid recovery from the acute mental ailment is difficult to estimate. The profound bromide sleep was a great contrast to the excitement of mania, and secured a prolonged condition of complete mental rest where it was much needed. The circumstances under which the illness broke out demanded stringent measures.

The second case was one of uncontrollable vomiting, a feature in neurasthenia, the subject of which was a lady doctor, sent to me by her brother, also a doctor, from the interior of China. As the vomiting seemed to me to be of undoubted nervous origin I suggested a trial of the bromide. Given by the rectum it caused such irritation that it could not be retained, irritation not confined to bromide, as was found later. Given by the mouth it took longer to produce its effects because of its frequent rejection. The stomach, however, seemed more tolerant of the drug than of other things, and after five or six days sleep set in, but not so profound as in the other cases described, with cessation of the vomiting habit. When recovery from the bromide was taking place the vomiting again manifested itself but much less than before treatment, and to an extent not causing any anxiety. I regretted not having pushed the drug effect to a greater degree, but not being certain of the amount retained, and as its effect appeared greatest sometimes two or three days after the last dose, I was afraid to continue it in this case. She is now, three months later and after a trip to Japan, apparently quite well.

It is noteworthy that the loss of alcoholic craving in the second case was pointed out by the astonished patient himself. It may not be out of place here to add a sketch of the method of treatment, with some reference to the immediate results of the drug. Having taken the weight of the patient and ascertained that there is nothing to contra-indicate this treatment in the way of organic disease, the sodium bromide may be given in two doses of 2 drachms, in solution every two hours for the first two days, and 1 drachm during the third day. None is given after bedtime on the third day. Three ounces of the drug in all will probably suffice, but more may be given to induce deep sleep that may continue for five or six days and nights, during which time milk alone should be given. Every night and morning during this time,

the patient should be placed on the commode for bladder and bowel evacuation, or oftener if there be any sign of soiling the bed linen. For a week or ten days after this sleep, the speech, which is at first indistinct, locomotion, which is of the feeblest or impossible, and the great confusion of ideas will all be seen gradually to improve, the mental condition, however, most slowly. Delusions, at first numerous, will lessen; memory will improve; sleep may then be irregular, but further treatment is undesirable. Solid food should be given as soon as it can be taken, and the bowels regulated, and after locomotion is recovered it is well to encourage the taking of exercise. The muscles may be observed to become tender, but this will pass off. Morphine may be given the first day in the habitual dose, halved the second, and none or but a small dose the third. Chloral may be cut off at once if there is a good sleep the first night. Cocaine may be dealt with like morphine. A case may appear well in three weeks, but at least other three weeks, and if possible longer, should be insisted on, as if for convalescence after a severe illness. An even, warm temperature of the room should be maintained. Warm night clothing for protection on getting out of bed or throwing off the blankets should be provided, and a nurse should be on duty day and night for at least the first three weeks.

OBSERVATIONS ON OXYURIS VERMICULARIS IN CHILDREN.

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THE presence of threadworms in the intestine is so common a trouble in childhood, and so often difficult to cure, that I venture to put on record the following observations which may be of interest in so far as they have a practical bearing on symptomatology and treatment. In 200 necropsies, as far as possible consecutive, on children under the age of 12 years at the Hospital for Sick Children, Great Ormond Street, the intestine was carefully examined for the presence of threadworms, and these were found to be present in 38 cases, that is, in 19 per cent. When, however, only children over the age of 2 years were included, the percentage was much higher; in a series of 100 necropsies on children between the ages of 2 and 12 years, threadworms were found in 32 cases, that is, in 32 per cent.

The point, however, on which I wish to lay special stress is not the frequency of threadworms, which is familiar enough, but their situation. It is often stated that the threadworm inhabits chiefly the rectum and lower part of the colon and occasionally the cæcum, but the fact that the vermiform appendix is a favourite habitat of the threadworm has received but little attention.

In no fewer than 25 out of the 38 cases in which the oxyuris vermicularis was present the worm was found in the appendix vermiformis; in other words the threadworm was found in the appendix in two-thirds of the cases.

Moreover, the appendix is in some cases the only part in which the threadworm is found; in 6 of the 38 cases mentioned no threadworms were found either in the cæcum or elsewhere in the large intestine, but in each of these 6 cases threadworms were found in the appendix, and sometimes at its extreme tip.

The number of threadworms in the appendix is sometimes very large: thus in one case described below, 111 were present here; and it is noteworthy that these large numbers may be found in the appendix, when only very few or none are present in the large intestine.

A further point, which may be of significance, is the immature character of the worms found in the vermiform appendix. In some cases only one or two of the worms found here were full grown, the rest were extremely minute, measuring 1.5 to 3 mm. in length, and requiring the use of a lens for accurate counting. These minute worms had already acquired the characteristic differences of sex, from which it could be determined that many, probably the majority, were immature females, though some certainly were males. It has been stated by Blanchard¹ that the embryo when first hatched measures in the case of the female 1.7 to 1.97 mm., and in the

male 1.1 to 1.8 mm., whereas the full-grown female measures 9 to 12 mm., and the male 3 to 5 mm. in length. Many therefore of the minute threadworms found in the vermiform appendix must have been hatched quite recently.

This observation seems to throw considerable doubt upon the view held by Leuckart and others, and now current in the textbooks, that the *oxyuris vermicularis* never multiplies in the intestine; it is absolutely necessary, they say, that the ova should be passed and reintroduced into the mouth, and so into the stomach, in order that they may be hatched; in other words, every single threadworm passed from the bowel has been introduced as an ovum from without into the alimentary tract.

Were such a view correct, it would be difficult to understand why threadworms are so rarely found in the small intestine. The embryo is said to go through the earliest stages of growth here after being hatched in the stomach, and by the time it comes to the large intestine it has reached, or almost reached, maturity. If this be so, then considering the enormous number of threadworms which are passed by some children for months or even years, and how variable must be the rate of passage of each of these worms through the small intestine, one would surely expect that the young threadworms would frequently be found at necropsies still in the small intestine, whereas, as a matter of fact, this very rarely happens. I have found young threadworms once as high as 45 inches above the ileo-cæcal valve, and two or three times I have seen mature worms either just above the valve or in the last few inches of the ileum, but such a finding has been very exceptional in my experience.

Further, this hypothesis does not explain the immaturity in some cases of almost all the threadworms found in the appendix, for even supposing that owing to the variability of rate of transit through the small intestine the degree of maturity varies in those that have reached the large intestine, it is nevertheless hardly conceivable that a large number of very immature threadworms, hardly larger than those just hatched, should happen to congregate in the vermiform appendix, whilst the great majority of those in the cæcum are almost or quite full grown.

The presence, therefore, of numerous very young threadworms in the vermiform appendix, associated with only a few full-grown ones, seems to show that at least in some cases, the vermiform appendix serves as a breeding place for the *oxyuris vermicularis*. It might be added that although there is experimental evidence to prove that the swallowing of the ova is followed after a few weeks by the appearance of threadworms in the fæces, the proof that every threadworm that is passed from the bowel has been introduced in this way is yet to seek. According to the accepted view we are asked to believe that a child who for months, and sometimes years, passes scores of threadworms daily in its stools, has introduced into its mouth as an ovum every single one of these worms. To support this theory it is necessary to suppose either that the ova are so widely distributed from the fæces that they are reintroduced in various articles of food, or else that they are introduced by the fingers directly from the anus. Both these sources are supposed to contribute to the supply.

But if the ova were distributed in such enormous numbers that one child could swallow hundreds, or possibly thousands, of them in articles of food, it would be difficult to see how any person in an infected house could possibly escape being infected also. It happens, indeed, not very rarely that more than one child in a family is suffering from threadworms; but this does not happen with sufficient constancy to justify the assumption that such a source is the usual, or even a common one.

If, again, the fingers be the source, then considering the number and persistency of threadworms in the fæces, one can only suppose that the number of ova on the fingers should also be very large and easily demonstrable. With the object of investigating this point, I selected five children who were passing large numbers of threadworms, and gave orders to the mother that the hands were to be left unwashed after the night's rest. The dirt on the finger ends and under the nails of all the fingers was then scraped off and examined microscopically, in three of the cases on two occasions, in two of them once.

The result of the examination was that one solitary ovum

was found in the dirt under the nail of one child out of the five. Further investigation would, of course, be necessary before one could make any definite statement on this point, but this observation, so far as it goes, seems to show that the dirt on the fingers is extremely unlikely to supply ova in sufficient numbers and with sufficient constancy to keep up the continual discharge of enormous numbers of threadworms from the bowel. In the one ovum found under the nail a fully-formed embryo in the tadpole stage was present, and one cannot doubt that if this had been swallowed—and it is to be remembered that even when the ova do happen to be present on the fingers it is by no means a certainty that they will be swallowed—the embryo would in due time have become a mature threadworm in the intestine.

That a certain number, possibly even a large number, of threadworms are introduced as ova into the mouth from one or other of the sources mentioned is not improbable, but the observations which are here recorded suggest, I think, that the *oxyuris vermicularis* also multiplies in the intestine, and that the appendix vermiformis is in some cases its breeding ground.

On this view the extreme obstinacy of those cases in which, in spite of all treatment, threadworms are discharged in the fæces for months or years, becomes at once intelligible. The difficulty of dislodging threadworms from the tip of the appendix where they are not uncommonly found, is sufficiently obvious; and one can well imagine that a few female worms maturing here would keep up a continual supply of young threadworms, many of which would gradually find their way out into the cæcum, and so pass down with the fæces.

So many of the ailments of childhood have been attributed to "worms," some with good reason and some with none, that one hesitates to add another to the list. I wish, however, to draw attention to a condition which might almost have been foretold in the light of the previous observations on the presence of large numbers of threadworms in the vermiform appendix.

A boy, aged 9, was admitted into the Hospital for Sick Children under the care of Dr. Lees for acute rheumatism and pericarditis. Four weeks before death he complained of pain in the right iliac fossa. Pericarditis and probably pleurisy being present, the boy was questioned carefully as to the situation of the pain in view of the possibility of the pain being from diaphragmatic pleurisy, and being described, as so often happens with children, with no strict accuracy. The boy, however, who was very intelligent, persisted in localising the pain definitely in the right iliac fossa. This part was therefore particularly examined, but no abnormal resistance and no tenderness could be detected. The pain passed off without further evidence of appendicitis.

Post mortem acute pericarditis and pleurisy were present. The whole of the colon was minutely examined with the naked eye, and the mucus in the cæcum scraped off with a knife and examined microscopically, but only in the latter situation were two threadworms present. The vermiform appendix appeared thicker than normal, as if swollen, and this was due to actual thickening of its wall, not to distension of its lumen. The mucus here also was examined microscopically. In the proximal inch not a single threadworm was found, but in the remaining 2½ inches at the distal end no fewer than 111 threadworms were counted, nearly all of which were very small ones, many of them measuring scarcely one-sixteenth of an inch (about 1.5 mm.), while some of the mature worms present contained large numbers of ova.

This case may, I think, be taken as evidence that pain in the right iliac fossa may be associated with a catarrhal condition of the appendix as a result of threadworms.

The discovery of this association seemed to throw some light on another case which was of very uncertain nature.

A boy, aged nearly 6 years, was admitted to the Hospital for Sick Children, under the care of Dr. Lees, for abdominal pain and vomiting. The pains in the abdomen had been present several months; the vomiting had only been present four days. The bowels were regular. The child did not look particularly ill. He complained of some pain in the right iliac fossa; the abdomen was quite lax. In the right iliac fossa there was some vague thickening the nature of which was uncertain; it was thought to be due either to inflammatory adhesions or to enlarged glands, but the child allowed free palpation here, and the presence of any tenderness was doubtful; the hip was extended freely; the temperature was 100.2°. I thought at the time that the case was one of appendicitis, but was puzzled by the extreme mildness of the symptoms. These disappeared in a few days, and the boy was discharged apparently well. Unfortunately no inquiry was made at that time as to the presence of threadworms in the stools. Within the next few months the boy was found to be passing large numbers of threadworms continually, and one or two round worms also, and on inquiry there was reason to believe that he had been suffering from worms before his stay in the hospital. Frequent vomiting, night terrors, and fits occurred, and the relation of these symptoms to the passage of threadworms was very striking. The mother, an intelligent observer, herself noticed that each time the threadworms diminished as the result of treatment, the symptoms diminished, and the boy was better in every way, only to relapse again as the threadworms re-

appeared. The threadworms persisted in spite of all treatment for two years.

It seems probable that in this case, as in the preceding, the symptoms may have been due to the presence of threadworms in the appendix, which would also account for the obstinacy of the case, if the view I have suggested be correct. That pain in the right iliac fossa was due to threadworms in the appendix has seemed possible in other cases, but it can only rarely happen that actual evidence can be obtained as in the first case mentioned. There was, however, ample evidence in the series of 200 cases examined *post mortem* that the presence of threadworms may cause swelling and thickening of the vermiform appendix, especially when the worms are present there in large numbers. Such a condition was found several times, and, indeed, it was sometimes possible to predict the presence of threadworms in the appendix before opening it from its swollen appearance. The following cases may serve as typical instances:

W. M., aged 2½ years; empyema, suppurative pericarditis, and commencing peritonitis. The vermiform appendix had a markedly swollen and thickened appearance: the rest of the intestine appeared quite normal. The appendix was found to contain 20 threadworms, nearly all of these being in the distal inch; of this number, only 5 were full-grown females containing ova; the rest were very minute, measuring from about 3 mm. upwards; many of them were females, but some were males. Only 4 threadworms, all full-grown, were found in the large intestine; no young ones were seen with the naked eye, nor in portion of the mucus examined with the microscope. One full-grown female was found 4 inches above the ileo-cæcal valve.

J. L., aged 3½ years; tuberculous meningitis. The vermiform appendix had the typical swollen appearance suggesting at once the presence of threadworms; it was therefore examined carefully. In the distal ½ inch, close to the tip, 26 were found; in the rest of the appendix 33, or 43 including 10 at the mouth of the appendix—that is, 69 in all. Most of those in the appendix were very young females. The mucus of the lower part of the ileum near the ileo-cæcal valve was examined microscopically, but showed no ova and no embryos. There were numerous threadworms in the colon and rectum.

A. A., aged 4 years; spinal caries, tuberculosis. The vermiform appendix was much swollen—"nearly as thick as one's little finger." The appearance suggested the presence of threadworms. The mucus from the appendix was examined with a low power of the microscope, and showed 43 threadworms, chiefly very minute young females. There were many threadworms in the cæcum but only a few in the rest of the colon.

The above observations suggest some practical points with regard to treatment. The idea that the rectum is the chief habitat of the threadworm is erroneous and misleading; it is here that the worm, perhaps, most often causes symptoms—namely, itching and worry, but it is not here that the worm is most commonly found. It is most often present in the cæcum, and, as I have shown, in two-thirds of the cases it is present also in the vermiform appendix; moreover, in some cases it is found in the small intestine.

Any injection therefore which is only large enough to reach the top of the rectum or the lower part of the colon is not likely to do much good. Some have even gone so far as to say that injections are useless, on the ground that it is not possible to reach the cæcum by this means. Such a statement is no doubt perfectly true if the injection consist of only 3 to 4 ounces of fluid. With such a quantity no part higher than the descending colon is likely to be reached. But with larger quantities—12 to 18 ounces or more—it is quite possible to fill not only the cæcum, as is apparent in the treatment of intussusception by injection, but also the vermiform appendix, if one may judge from *post-mortem* experiments in which I have repeatedly demonstrated this. Injections, therefore, are of the greatest importance, but it is essential that large quantities of the fluid should be used—a child of 6 to 12 years will often tolerate as much as 16 to 20 ounces—and experience has shown that large injections of salt and water or of infusion of quassia are often effective.

Treatment by injection alone, however, often fails, and this is easily intelligible, for the large intestine varies so much in length, and therefore in capacity, in children of about the same age, that it is practically impossible to know what amount of fluid is required in any given case. Thus, in one child, aged 15 months, the large intestine was 28 inches long, in another, aged 15 months, it was 34 inches, while in another, aged 23 months, it was 44½ inches long, and similar differences were found in older children.

Moreover, as the above observations have shown, threadworms may be present, though not very commonly, in the small intestine; and the chance of reaching these by any injection is very slight, even when they are situated, as is usually the case, only just above the ileo-cæcal valve. In the

post-mortem experiments alluded to it was found that occasionally the fluid did pass up into the small intestine, but it is obvious that the conditions after death are so different from those during life that any conclusions drawn therefrom must be of very doubtful value. There is, however, some evidence that this occasionally happens during life, and in one case where an enema of olive oil followed by a large enema of soap and water, was given as an aperient to a boy, aged 4½ years, twenty-four hours before death, I found the oil as high up as 6 inches above the ileo-cæcal valve. This, however, is probably quite exceptional, and for practical purposes one may say that the small intestine cannot be reached by injections.

It is necessary, therefore, to give drugs by the mouth also, and no drug has proved more effectual in my experience than *santonin*. At the same time the prevention of any possible conveyance of ova to the mouth must be attempted, for, as shown above, this is probably one mode of keeping up the supply of worms, and the cutting short of finger nails, and the prevention—by mechanical restraint if necessary—of scratching the anus, are no unimportant adjuncts to treatment.

The conclusions to which the above observations would seem to point, are:

1. That the appendix vermiformis is a common habitat of *oxyuris vermicularis* in childhood.
2. That the generally accepted view that every single ovum of *oxyuris vermicularis* must be swallowed before it can be hatched, is at least open to doubt, and there is a strong probability that the appendix vermiformis serves in some cases as a breeding place for threadworms.
3. That the presence of threadworms in the appendix may cause a catarrhal condition therein, as shown *post mortem* by a swollen appearance, due to thickening of its wall.
4. That this swollen condition of the appendix due to threadworms is associated in some cases with pain in the right iliac fossa which may simulate ordinary appendicitis.
5. That in the treatment of threadworms large injections must be used, and in view of the difficulty of dislodging the worms from the appendix, and their possible presence in the small intestine, the injections should be combined with the administration of drugs by the mouth.

REFERENCE.

¹ *Zoologie Médicale* Paris, 1889, i, 713.

NEUROTIC ULCERS OF THE MOUTH

(STOMATITIS NEUROTICA CHRONICA).

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IN 1894, Jacobi of New York published in the *Transactions of the Association of American Physicians* a paper on the above subject, in which he described three cases that had come under his notice. He collected all the cases he could find in literature, namely those reported by Kaposi, Kopp, Flatau, and Mandelstamm, and came to the conclusion "that such cases must be very rare."

The cases I am about to describe I have met with during the last few years—two in private, and one in hospital practice, all being women. The patients were rather more of the hysteroid or neurotic than the insane type, as those described by Jacobi, two of whose cases were men. I am also inclined to believe that the disease is much commoner than he supposes, but that it is frequently overlooked. Such cases are often classed as simple catarrhal or dyspeptic ulcers, whereas I consider they are the direct result of a trophoneurosis, of which dyspepsia in some form or other may be, and often is, another expression.

CASE I.—The first case is that of a widow, aged 74, who has had good general health. There is no known mental disease in the family. She had ten children before she was 35, and several miscarriages. Three children died from diphtheria, a fourth (13) from tuberculous peritonitis, and another at 53 from carcinoma of the kidney. The other children are living and well. She has lived an extremely active life.

The first ulcer came on the gums in 1875 during great domestic trouble, and it lasted a few weeks. During a visit the country the ulcer healed up. Six months later she came back to London, and the ulcers soon returned. At this time she had a perfect set of teeth. The ulcers usually came between the teeth, and there was great difficulty in applying local applications to them.