to hope that we possess in it a remedy of great value in many states of nervous system characterised by the blending of hyperexcitability and debility. I have said nothing of the gout, which he seems to have had, as a *causa mali*, for it seems to me quite improbable that it had anything to do with the production of the motor disorder or the drowsiness: they did not alternate with the articular affection.

Shortly, we may regard the case as one where the nervous centres were originally of rather infirm, unstable constitution, and subsequently had their nutrition impaired by injury received in a fall, so that they performed their functions feebly and unsteadily. The lead-poisoning may at the same time have contributed something to the deterioration of the nerve-force by acting injuriously on the nerve-cells, but it was by no means the principal cause of disorder.

It may be well to consider how this poor fellow would have fared if his concussion had been received in a railway collision, and he had sought compensation in a court of law. Would not suspicions have been expressed rather freely that he was malingering, or at any rate exaggerating considerably? and might he not have had difficulty in convincing the jury that his malady was genuine? It is quite right that all claims for compensation should be closely scrutinised; but mistrust may be carried too far, and I call your attention to this case as a proof that concussion may produce symptoms which, though very real, might be regarded with much suspicion by those who have chiefly given their attention to cases of severe injury.

REMARKS ON A CASE OF HÆMATURIA FROM THE PRESENCE OF THE BILHARZIA HÆMATOBIA.

By HENRY SIMPSON, M.D.,

Physician to the Manchester Royal Infirmary.

THE publication of Dr. Cobbold's interesting paper in the JOURNAL of July 27th reminds me of a patient, suffering from the presence of the Bilharzia hæmatobia, who was under my care last year in the Manchester Royal Infirmary. He was seen by many of my medical friends, and I read a paper before the Medical Society of this city, on the History of the Bilharzia and the Phenomena due to its presence as a Parasite. This I had intended to send to the JOURNAL; but, as Dr. Cobbold's paper goes over much of the ground I traversed, and in a manner I cannot attempt to rival, I shall not do so. As, however, but few of these cases have been reported, and they still possess some of the interest of novelty, and of difficulty as regards efficient treatment, I may perhaps be allowed, as briefly as possible, to touch on some of the points of interest in the case.

The patient, William Ray, aged 20, presented himself as an outpatient about the end of January 1871, suffering from hæmaturia. Mr. Roberts, the physicians' assistant, learning that he had been in Egypt, and recollecting that this disease was endemic there, and connected with the presence of the Bilharzia, brought him to me. I at once examined the urine microscopically, and discovered the ova of the worm. The patient was slight but well built, as befitted his occupation, which was that of a jockey. He looked ill and weak, and was very anæmic, but his chief complaint was of the hæmaturia. He went to Egypt in February 1869, to follow his calling in the service of the Viceroy. The day after his arrival at Cairo, his leg was broken by a donkey he was riding slipping down and falling on him. In three months he left Cairo for Alexandria, where he remained nine months. He then spent six weeks in Cairo, after which he was in Alexandria until his return to England in November 1870.

The history of these cases is chiefly interesting so far as it may throw light on the introduction of the parasite into the body, and suggest preventive treatment.

Griesinger supposed that the young of the Bilharzia exist in the water of the Nile and in the fishes abounding in it, or even in the bread, grain, or fruit. Dr. Cobbold, however, in a paper published early last year, with which I infer that his views are still in accord, states that he thinks it more probable that the larvæ will be found in some of the gasteropod molluscs proper to the localities from whence the adult forms have been obtained. Unfortunately, his recent researches have not as yet proved this supposition to be correct, but it still, I think, suggests the direction for future inquiry. In my paper alluded to, I ventured to criticise the views put forth by Dr. Harley as to the probable mode of its introduction into the human system, as not in unison with those of the best observers. Perhaps I may quote the following sentence. "The view above given" (referring to Dr. Harley's paper) "is certainly opposed to what has been made out as to the deve-

lopment of other trematode worms, and I cannot but believe that it will be found eventually that man becomes infested with the parasite, not when it has just escaped from the egg, but when it has advanced to a stage beyond that of the ciliated embryo as we first see it, and that one or more intermediate hosts will be necessary before he is honoured by its presence."

Now, while my patient was at Alexandria, he drank water from a well; when he was at Cairo, he drank the water of the Nile. In both places, it was brought to the house in skins by Arabs. These men, by the way, used to wash their food, clothes, etc., in the spring at Alexandria. Generally he took the water filtered, but sometimes it was unfiltered. At Cairo, the Nile water was also brought in skins, and generally filtered, but occasionally, when thirsty, he took that also unfiltered. Before filtration, "it was sometimes very dirty-white in colour, and at other times clayey-looking." In Alexandria, he ate a good deal of water-cress, which he said was well washed. His living generally was good. I have no information as to his eating fish or shell-fish.

Now, the above details will not decide the source of infection. I incline to the belief that it was the unfiltered Nile water; but of course the water-cress, though said to be washed, might have conveyed small molluscs, etc., to the stomach.

It was not until January 1870, eleven months after reaching Egypt, that he noticed blood in the urine. It then came in single drops at the end of micturition, but gradually increased in quantity. A week after the appearance of the blood, he felt a burning sensation at the end of the penis after micturition, and a little pain during the act. He said that at one time a piece of clotted blood used to shoot out first, the urine then became clear, but never so clear as healthy urine, and towards the end of the flow it was freely mixed with blood. In August 1870, he had an attack of gonorrhœa, during which time he estimated that the quantity of blood, which was then much increased, amounted at the most to a pint in the twenty-four hours. This is probably an exaggeration, though not, I think, wilful.

During his stay in Egypt, he went under the care of three medical men from this country, none of whom appeared to recognise the cause of his complaint; as one treated him, according to the lad's statement, for inflammation of the kidney and irritation of the bladder, and the other two for stone in the bladder.

He had often great pain round the loins, especially in wet weather, and the testicles often swelled. During the twelve months of his illness he had lost colour, and his pallor was very noticeable when he was admitted, February 4th, 1871. His pulse was 72, small, weak, and irregular in rhythm. Nothing special had to be noticed as to the heart and lungs, except some irregularity in the action of the former. The tongue was slightly furred and moist, but apt to become dry at night. The appetite was generally fair, and the bowels somewhat confined. The abdomen was soft and normal in appearance. There were, however, slight fulness and tenderness on pressure at the epigastrium; and the liver extended a little below the ribs. The spleen was not enlarged. He complained of tenderness on the right side, where the lumbar and hypochondriac regions were grasped by the hand. There was, moreover, some tenderness on deep pressure over the hypogastrium. The desire to pass urine was rather troublesome, and he had frequently to get up three or four times in the night. In the twenty-four hours, he usually passed fifty to sixty ounces of urine, which contained a good deal of albumen, but no sugar. The reaction was acid, and the specific gravity ranged from 1007 to 1015. On standing, there was a dense and copious deposit, consisting chiefly of pus-cells, with blood-corpuscles dispersed among them, and here and there a small clot. Sometimes he passed urine into several vessels, in order that we might notice if the ova were more abundant at one period of micturition than at another. The following instance will sufficiently illustrate this.

Vessel No. 1. Urine of a pale greenish straw-colour. Deposit white and scanty, made up of pus, with numerous blood-corpuscles; but no ova observed.

No. 2. Slightly darker in colour; whitish deposit more abundant. This contained numerous ova and some escaped embryos.

No. 3. Dark brown in colour. Deposit very abundant, and containing numerous small blood-clots. Ova very numerous. In one small shreddy fragment, in which much blood was entangled, I counted twenty-two ova in the field at once, when using the one-inch object-glass. They were, therefore, much more abundant in the latter stage of micturition than the earlier, as, indeed, one would have expected; for the turbid portion of the urine would remain at the bottom of the bladder until the expulsive force, having drawn off the supernatant liquid, began to tell on the dregs.

During his stay in hospital, he never passed much blood at once, but

there was always a little; and, even when to the naked eye the urine was apparently free from it, numerous blood-discs were displayed by the microscope.

Dr. Cobbold has described the ova of the Bilharzia so carefully, that I will not occupy space by doing so. I am glad, however, to be able to prove that, as to the position of the spine, the first describers were not only not in error, but were free from exaggeration in depicting it occasionally as lateral. Generally, the ova which I observed were symmetrical in form, with the spine at one of the terminal poles—remining one of the spike on Von Moltke's helmet, as seen in the photographs. Sometimes—but rarely, however—it was quite lateral, and growing from the broad face, and not from the narrow edge of the shell.

I may mention also another fact which has not been noticed, so far as I am aware, by previous observers, which is, that the anterior extremity of the embryo has no constant relation to the poles of the shell; the head sometimes being directed towards the spike, sometimes to the plain end.

Passing over all the interesting phenomena attending the escape of the embryo from the egg, and on which my observations accord with those of Dr. Cobbold, I will return to the clinical bearings of the question.

During his stay in the Infirmary, there was no marked change in the condition of the patient; but the hæmorrhage decidedly lessened. There is no doubt that the mucous membrane of the urinary passages had suffered from the inroads of the parasite; and that there was chronic pyelitis, most probably affecting the right kidney. Griesinger found the worm inhabiting the blood-vessels of the bladder, ureters, and kidneys, also the portal and mesenteric veins; and he states that he found empty egg-shells in the blood of the left ventricle. In many cases, the constitution becomes gradually undermined, and death results from pneumonia, diarrhoea, and other disorders. In some of the cases of pneumonia, it is not improbable, as Küchenmeister suggests, that embolism plays an important part.

As regards treatment, it is evident that we must be considerably hampered. The worm lives in the blood-vessels, and can only be acted on by soluble substances carried to it with the blood-stream, and necessarily in a state of considerable dilution. If, however, we can give a remedy sufficiently powerful to kill the parasite, will not the dead worms in the blood-vessels be almost more dangerous than the same guests when living? They will be more liable to be carried on by the blood-current—those in the systemic veins to the right heart, thence to be driven into the pulmonary capillaries, where they may give rise to inflammatory changes in the lungs. Those in the portal vein will, of course, be carried into the capillaries of the liver; and Griesinger strongly suspected some connexion between this parasite and hepatic abscess. The danger, moreover, of septic poisoning from the dead worms, must not be forgotten. Griesinger, our great authority as to these points, gives an illustration of the immense numbers in which they occur, when he says that the portal vein has been found filled with them.

The treatment adopted during the patient's stay with us was chiefly directed to the improvement of his general health. For some time he took quinine with perchloride of iron. For a short period I gave him small doses of turpentine, which, however, produced irritation of the urinary passages, and somewhat increased the hæmorrhage; and, in spite of my better judgment, I gave him some large doses of iodide of potassium, as there is some reason to believe that they have been useful in bringing about the death of hydatid cysts. No doubt the infusion of buchu, as recommended by Dr. Cobbold, would be useful in lessening the irritability of the bladder; but I must confess my scepticism as to the good effects likely to result from the treatment suggested by Dr. Harley. And I cannot but believe that, as to any direct treatment, we are powerless for cure, and must rely on judicious palliation.

On the whole, I think it is clear that the prospect of success lies rather in prevention than cure. It may be long before the people of any country will be so educated as to observe preventive measures; but governments might do something by diffusing a knowledge of what such measures should be, and the reasons for their adoption. The drinking water in Egypt, the Cape, and other countries where this parasite occurs, should of course be perfectly filtered. All vegetables should be well washed; but it would be safer to avoid all salads, and only to use vegetables boiled. All shell-fish should be abjured, or thoroughly cooked; and no fish, though dried or smoked, should be eaten without cooking.

Dr. Harley recommends that "water should be conveyed from its source to its destination in covered channels, so that the urinary and probably the fecal products of those infested with the parasite may be prevented mixing with it." This is desirable for obvious reasons, but not for those given by Dr. Harley, whose views as to the development

of the Bilharzia do not, as Dr. Cobbold very clearly indicates, seem to harmonise with those of the most eminent scientific observers. Our danger lies rather in the introduction of the parasite into the body in one of its intermediate stages between the ovum and the sexually perfect worm, than in swallowing the ova themselves. The question of its possible acclimatisation with us is one not merely of scientific, but of practical moment. Although an inhabitant of climates hotter than our own, we do not know as yet that our temperature is too low for its development, and we have in favour of it the fact that the lower forms of life are usually tolerant of widely diverse external influences. Bearing in mind, therefore, the enormous increase in the number of those who for business purposes, for pleasure, or in pursuit of health, dwell for a time in its present abodes, and then return to us, we may fairly assume that its ova will more or less frequently be freely scattered in our midst. So far as any evidence of which we are in possession at present is concerned, we have probably all the conditions necessary for its development, except temperature. This exception may turn out to be our safeguard, but as yet there is not sufficient proof of it; and we may well believe that it is not impossible, perhaps not even improbable, that the Bilharzia hæmatobia will find a home in this country. I am aware that Dr. Cobbold's experiments do not support this supposition; but, as he says, "the conditions under which the experiments were made departed in several respects from those that are presumably essential to success in the ordinary course of nature."

While in the Infirmary, my patient had several letters urging him to return to Egypt, which he was very wishful to do, and at length one stating that his passage was paid for, etc. This he could not resist; so he left, promising to write on his arrival at Cairo. A letter came in due time, in which he said that his general health had improved much on his journey.

I could only ascertain that he was acquainted with one case like his own, and this was in the person of a native soldier. His opportunities of inquiry would probably not be numerous, and of course the spur of scientific curiosity was wanting. It seems strange that the diagnosis of his case should not, so far as we could learn, be made out by the medical men who saw him, when we remember that, until recently, almost all we knew of the disease was derived from Egypt.

ON THE EXTERNAL AND INTERNAL ORIFICES OF THE UTERUS: THEIR ANATOMY, PHYSIOLOGY, AND PATHOLOGY.*

By J. HENRY BENNET, M.D.,

Late Obstetric Physician to the Royal Free Hospital, etc.

THE subject which I have taken for the present communication is so extensive, it can be viewed and discussed in so many different lights, that a volume might be written on it. My object, however, is merely to lay down a few general anatomical and physiological data, as a basis for treatment in pathological conditions. My hope is, that the discussion of these data at this meeting may establish a little order in the chaos of present practice at home and abroad.

Anatomically, there are two distinct cavities in the uterus; that of the body, the larger one; that of the cervix, the smaller one. It is in the cavity of the body of the uterus that conception and the development of the foetus take place, whilst the cavity of the cervix is a species of antechamber which precedes and protects the more sacred internal precincts. The circular fibres of the body of the uterus converge towards the cervix, are continued throughout its entire extent, and form the greater part of its tissue, half an inch in thickness. These circular fibres of the cervix are endowed with vitality, and with contractility in the cervical canal, even in the non-pregnant state, as is seen on introducing a stick of nitrate of silver, or a solution of nitrate of silver, into the cervical cavity. Its entire extent instantly contracts, so that the uterine sound can no longer be introduced without an effort, although the canal may have been quite patulous before. These circular fibres, in the healthy uterus, surround and form an infundibuliform cavity in the central cervical region; whilst at the outer or vaginal outlet, and also where the cervix passes into the uterine cavity, they are in circular approximation, like the sphincter ani. They thus close the canal in both directions, and resist the effort to enter either cavity with sound or bougie, and that by a vital contraction. In a word, the cavity of the uterus is separated from the cavity of the cervix by a regular sphincter, a fact which I was the first to demon-

* Read in the Midwifery Section at the Annual Meeting of the British Medical Association at Birmingham, August 1872.