Age Incidence.

The comparative rarity of severe appendicular trouble in children during the first few years of life may possibly be explained by the relatively wide and frequently funnel-shaped aperture of the appendix at this period, allowing of the ready entrance and exit of faecal matter. The corresponding, though less marked, rarity of such trouble in old people is accounted for by the pronounced fibrotic changes so commonly seen in senile appendices, changes which, according to Aschoff,⁹ represent previous mild attacks of inflammation, and which, as a rule, altogether preclude the entrance of faecal matter. In the intervening age period, particularly that earlier part of it which might be termed the period of physical activity and dietary indiscretion, the anatomical condition of the appendix predisposes it to acute morbid changes of both inflammatory and obstructive types.

CONCLUSIONS.

1. Two acute pathological processes are met with in the vermiform appendix—acute appendicitis and acute appendicular obstruction.

2. Clinically acute appendicitis is distinguished by the signs of inflammation, there being from the onset a rise in pulse and temperature.

Acute appendicular obstruction gives rise to vomiting, colicky pain, and abdominal tenderness, but at the outset to no appreciable rise in pulse or temperature.

3. The changes occurring in an appendix the lumen of which is completely obstructed depend on the presence or absence of faecal matter within its lumen.

4. In experimental obstruction in an artificial appendix the changes vary greatly according to the nature of the diet of the animal previous to the experiment, rich protein diet being associated with much more rapidly destructive changes than carbohydrate.

5. Undigested protein, putrefactive bacteria, and an alkaline reaction together produce rapid gangrene in the walls of the obstructed organ.

6. The prevalence of the severer forms of acute appendicular disease in Western as contrasted with Eastern peoples is probably to be explained by the animal diet indulged in by the former.

7. On the same lines may be explained the increasing frequency of such disease in large industrial areas and its relative frequency in the male sex.

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LEECHES :

EXOTIC LEECHES.

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Non missura cutem, nisi plena cruoris, hirudo.

HORACE.

THE extension of war into the Near and Far East has brought into action two genera of leeches which were and still are the cause of extreme inconvenience and even of real danger to troops operating in these areas. The enemies of our allies will still insist on fighting on richly stocked leech grounds. For in the new war area, in southern Europe, Asia Minor, Syria, Egypt and the southern lands of Asia, two genera of leeches which are indeed not the friend but the enemy of man, especially of the soldier, abound.

The first of these two is *Limnatis nilotica* (Sav.), and it is from Savigny that I have stolen the picture of this species. It is a leech of considerable size, attaining a length of 8 to 10 cm., and its outline rather slopes to the anterior end. The dorsal surface is brownish-green with six longitudinal stripes, and the ventral surface is dark. It is a fresh-water leech and it occurs from the Atlantic Islands, the Azores and the Canaries—its western limit—all along the northern edge of Africa until it reaches

Egypt, Palestine, Syria, Armenia, and Turkestan, where it achieves its uttermost eastern boundary. This leech lives in stagnant water; especially does it congregate in drinking-wells—the wells so often mentioned in the New Testament. In the Talmud (Abōdāh Zārāh, 17b) an especial

Fig. 1.—*Limnatis nilotica*, side view. Oral sucker, showing characteristic, median, dorsal slit and three teeth; ventral view. (From Savigny.)

warning is given against drinking water from the rivers or wells or pools for fear of swallowing leeches. The Old Testament Jew knew then nearly as much as we know now about these leeches. They were the cause of endless trouble to Napoleon's soldiers in his Egyptian campaign.

I cannot recall that Napoleon talked much about spreading culture,* but he certainly did it. He took on his incursion into Egypt a score of the ablest men of science he could gather from France. He established in Cairo an "Institut" modelled on that of Paris, and his scientific "corps" produced a series of scientific monographs on Egyptian antiquities and on the modern Natural History of Egypt that has not yet been equalled by any other invading force. He freed the serfs in Germany, he codified the laws of France, and these laws were adopted by large parts of Europe; he extended the use of the decimal system. Napoleon had a constructive policy, and was never a consistent apostle of wanton destruction. If he destroyed it was to build up again, and in many instances he "builed better than he knew." He seldom so mistook his enemies as to destroy, to terrify; the "frightfulness," though bad enough in his times, had limits. Napoleon had at least in him the elements of a sane and commonsense psychology. He knew that what was "frightful" to the French was not necessarily "frightful" to the Russian. Amongst the wonderful series of books and monographs on Egypt which described the varying activities of the savants he took in his train, and who, at the confines of the eighteenth and nineteenth century invaded the country of the Pharaohs, none is more remarkable than Savigny's monograph on the "Natural History" of that country. And in this folio the leech *Limnatis nilotica* was for the first time fully described and depicted.

This particular leech is swallowed by man, by domestic cattle, and doubtless by wild animals, with drinking-water. Amongst the medical writers of the Eastern world in classical times who mention leeches there was always, as there was amongst the authors of the Talmud, a great and haunting fear of leeches being swallowed, and these writers mostly wrote from the area where *Limnatis nilotica* still abounds.

According to Mastermar, who has had, as a medical officer in Palestine, a first-hand opportunity of studying this leech, the pest attaches itself to the mouth or throat or larynx during the process of swallowing, and he is convinced that if it be once really swallowed and thus reaches the stomach it is killed and digested.

Limnatis nilotica, unlike *Hirudo medicinalis*, the medicinal leech, is unable to bite through the outer integument of man and is only able to feed when it has access to the softer mucous membrane of the mouth, of

Fig. 2.—Anterior sucker of *Hirudo medicinalis*. This is to compare with the anterior sucker of *Limnatis nilotica*, which has a characteristic dorsal slit.

* I wonder if it is any use pointing out that the German word *Kultur* is not the equivalent—as our daily Press take it to be—of the English word "culture," brought into fashion forty years ago by Matthew Arnold. *Kultur* = civilization. The German word which we associate with "culture" is "Bildung."

the pharynx, or of the larynx and of the other thinner and more vascular internal mucous linings.

In Palestine these pests are particularly common in the region of Galilee and in the district of Lebanon. They are in these and other districts so plentiful in the autumn that almost every mule and almost every horse you come across is bleeding in its mouth or from its nose, for this species of leech is by no means only a human parasite. The natives, who know quite a lot about these pests, generally strain them out of their drinking water by running the water through a piece of muslin or some such sieve when they fill their pitchers. In certain districts these leeches in the local pools or reservoirs are kept in check by a kind of carp, *Capoeta fratercula*.

In the cases which recently came under Mr. Masterman's observation, the leeches were attached to the epiglottis, the nasal cavities, and perhaps most commonly of all to the larynx of their host. When they have been attached to the anterior part of the mouth, or any other easily accessible position, their host or their host's friends naturally remove them, and such cases do not come to the hospital for treatment.

The effect of the presence of this leech, *L. nilotica*, on the human being is to produce constant small haemorrhages from the mouth or nose. This haemorrhage, when the leech is ensconced far within the buccal, the nasal, or the pharyngeal passages of the host, may be prolonged, serious, and even fatal. Two fatal cases Masterman records—one of a man and the other of a young girl—both of whom died of anaemia produced by leeches.

The average patients certainly suffered. There was marked distress, usually accompanied by a complete or partial loss of voice; but all the symptoms disappeared and at once on the removal of the semi-parasite. Sometimes the leeches are attached so closely to the vocal cords that their bodies flopped in and out of the vocal aperture with each act of expiration and inspiration. The hosts of leeches so situated usually suffered from dyspnoea, and at times were hardly able to breathe.

The native treatment is to remove the leech, when accessible, by transfixing it with a sharp thorn, or they dislodge it by touching it with the so-called "nicotine" which accumulates in tobacco-pipes. But nicotine is destroyed at the temperature of a lighted pipe, so whatever the really efficient juice is, it is not nicotine. Still, as long as it is efficient, the native is hardly likely to worry about its chemical composition.

Masterman says that the two means he has found most effective were: (1) Seizing the leech, when accessible, with suitable forceps, or (2) paralysing the leech with cocaine. In the former case the surgeon is materially assisted by spraying the leech with cocaine, which partially paralyses it and puts it out of action. In the latter case, if the spraying of cocaine is not sufficient, Masterman recommends the application of a small piece of cotton-wool dipped in 30 per cent. cocaine solution, which must be brought into actual contact with the leech's body. The effect of the cocaine in contact with the skin of the leech is to paralyse it and to cause it at once to relax its hold. In such a case the leech is occasionally swallowed; but it is more often coughed up and out. Headaches and a tendency to vomit are symptoms associated with the presence of this creature in the human body; the removal of the leech or leeches coincides with the cessation of these symptoms.

In the Further East we come across another species of

leech even more injurious to mankind than *Limnatis nilotica*. This Asiatic leech is known as *Haemadipsa zeylanica*, and is one of a considerable number of leeches which have left the water and live on land.

From India and Ceylon, throughout Burma, Cochin China, Formosa to Japan, the Philippines, and the Sunda Island, this terrible, and at certain elevations ubiquitous, pest is spread. It lives upon damp and moist

Fig. 3.—The Japanese variety of *Haemadipsa zeylanica*. $\times 1$.

earth. The family to which it belongs is essentially a family which dwells only in the uplands and shuns the hot, low-lying plains. Its members do not occur on the hot, dry,

sandy flats. Tennant has described the intolerable nuisance they are in Ceylon. They are in fact of the many visible plagues of tropical Asia and its eastern islands perhaps the worst. Yet few have recorded their dread doings and those few have escaped credence.

Each specimen of *Haemadipsa zeylanica* is of a clear brown colour with a yellow stripe on each side and with a greenish dorsal stripe. There are five pairs of eyes, of which the first four occupy contiguous rings (Fig. 5); but between the fifth and seventh ring there are two eyeless rings interposed. As in the medicinal leech there are three teeth each serrated like a saw.

In dry weather they miraculously disappear and nobody seems to know quite what becomes of them; but with returning showers they are found again on the soil and on the lower vegetation in enormous profusion. Each leech is about 1 inch in length and is about as thick as a knitting-needle. But they contract until they attain the diameter of a

quill pen or extend their bodies until they have doubled their normal length. They are the most insinuating of creatures and can force their way through the interstices of the tightest laced boot, or between the folds of the most closely wound puttees. Making their sinuous way towards the human skin, they wriggle about under the under-clothing until they attain almost any position in the body they wish to take up. Their bite is absolutely painless, and it is usual for the human sufferer to become aware that he has been bitten by these silent and tireless leeches when he notices sundry streams of blood running down his body when he at last has the opportunity of undressing.

Sometimes, as Tennant's figure shows, these land leeches (*H. zeylanica*) rest upon the ground. At other times they ascend the twigs of herbs, grasses, and especially the leaves of the forest undergrowth. Perched upon the ends of growing shoots, leaves and twigs, stretching their quivering bodies into the void, they eagerly watch and wait the approach of some travelling mammal. They

Fig. 4.—*Haemadipsa zeylanica*, seen from above. $\times 2$. (From Blanchard.)

Fig. 5.—*Haemadipsa zeylanica*. Head, showing the eyes and the serrations of the jaw. Highly magnified.

Fig. 6.—*Haemadipsa zeylanica*, land leeches, on the earth. (From Tennant.)

easily "scent" their prey, and on its approach advance upon it with surprising rapidity in semi-circular loops. A whole and vast colony of land leeches is set in motion without a moment's delay, and thus it comes about that the last of a travelling or prospecting party in a land-leech area invariably fares the worst, as these land leeches mobilize and congregate with extraordinary rapidity when once they are warned of the approach of a possible host, but not always in time to engage in numbers the advanced guard.

Horses are driven wild by them, and have poor means of reprisal. They stamp their hooves violently on the ground in the hope of ridding their fetlocks of these tangled masses of bloody tassels. The bare legs of the natives, who carry palanquins, are particularly subject to the bites of these bloodthirsty brutes, as the palanquin-bearer has no free hand to pick them off. Tennant writes that he has actually seen the blood welling over the boots of a European from the innumerable bites of these land leeches, and it is on record that during the march of the troops in Ceylon, when the Kandyan

were in rebellion, many of the Madras sepoys, and their coolies, perished from their innumerable and united attacks. It is also certain that men falling asleep overnight in a Cingalese forest have, so to speak, next morning "woke up dead." These sleepers have succumbed during the night to the repeated attacks of these intolerable and insatiable pests.

Dr. Charles Hose, for many years Resident at Sarawak, has told me that on approaching the edges of woods in Borneo you can hear every leaf rustling, and this is due to the fact that the eager leech, perched on its posterior sucker on the edge of every leaf in the undergrowth, is swaying its body up and down, yearning with an "unutterable yearning," to get at the integument of man or some other mammal.

London, who wrote the best book about our adventure into Thibet some ten years ago, entitled *Lhasa* (London, 1905), says of Sikkim:

The game here is very scanty: the reason is not uninteresting. For dormant or active, visible or invisible, the curse of Sikkim waits for its warm-blooded visitor. The leeches of these lovely valleys have been described again and again by travellers. Unfortunately the description, however true in every particular, has, as a rule, but wrecked the reputation of the chronicler. Englishmen cannot understand these pests of the mountain-side, which appear in March, and exist, like black threads fringing every leaf, till September kills them in myriad millions . . . to remove them a bowl of warm milk at the cow's nose, a little slip-knot, and a quick hand are all that is required. Fourteen or fifteen successively have been thus taken from the nostrils of one unfortunate heifer.

When fully fed, a process which takes some time with *Haemadipsa zeylanica*, the individual leeches drop off; and they can be made to loosen their hold by the application of a solution of salt or weak acid. Attempts to pull them off should be avoided, as parts of the biting apparatus are then often left in the wound, and these may cause inflammation and suppuration.

When winter approaches the leeches die down with extraordinary rapidity, and the species "carry on" over the cold weather period in the form of eggs laid in cocoons on the ground, under leaves or other debris. Hence no land leech ever sees its offspring, and no land leech has ever known a mother's care.

EIGHTY-SECOND ANNUAL MEETING

OF THE

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PROCEEDINGS OF SECTIONS.

SECTION OF NEUROLOGY AND PSYCHOLOGICAL MEDICINE.

F. W. MOTT, M.D., F.R.C.P., F.R.S., President.

ON THE IMPORTANCE OF THE UNCONSCIOUS IN PSYCHOPATHOLOGY.

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WHEN we speak of a thing as being "unconscious" we must not forget that from the point of view of the functioning of the brain a thing may be unconscious to us in two ways—physiologically or psychologically. I shall only deal with the subject from the latter point of view. So that for our purpose we may define the unconscious as "the sum of all those psychological events which are not apperceived, and so are unconscious."

The unconscious contains all those psychic events which, because of the lack of the necessary intensity of their functioning, are unable to pass the threshold which divides the conscious from the unconscious; so that they remain in effect below the surface of the conscious, and flit by in subliminal phantom forms.

It has been known to psychologists since the time of Leibnitz that the elements, that is to say, the ideas and feelings which go to make up the conscious mind—the so-called conscious content—are of a complex nature, and

rest upon far simpler and altogether unconscious elements it is the combination of these which gives the element of consciousness. Leibnitz has already mentioned the *perceptions insensibles*—those vague perceptions which Kant called "shadowy" representations, which could only attain to consciousness in an indirect manner. Later philosophers assigned the first place to the unconscious as the foundation upon which the conscious was built.

But this is not the place to consider the many speculative theories nor the endless philosophical discussions concerning the nature and quality of the unconscious. We must be satisfied with the definition already given, which will prove quite sufficient for our purpose, namely, the conception of the unconscious as the sum of all psychical processes below the threshold of consciousness.

The question of the importance of the unconscious for psychopathology may be briefly put as follows: "In what manner may we expect to find unconscious psychic material behave in cases of psychosis and neurosis?"

In order to get a better grasp of the situation in connexion with mental disorders, we may profitably consider first how unconscious psychic material behaves in the case of normal people, especially trying to visualize what in normal men is apt to be unconscious. To obtain this knowledge we must first get a complete understanding of what is contained in the conscious mind; and then, by a process of elimination, we can expect to find what is contained in the unconscious, for obviously—*per exclusionem*—what is in the conscious cannot be unconscious. For this purpose we examine all activities, interests, passions, cares, and joys, which are conscious to the individual. All that we are thus able to discover becomes, *ipso facto*, of no further moment as a content of the unconscious, and we may then expect to find only those things contained in the unconscious which we have not found in the conscious mind.

Let us take a concrete example: A merchant, who is happily married, father of two children, thorough and painstaking in his business affairs, and at the same time trying in a reasonable degree to improve his position in the world, carries himself with self-respect, is enlightened in religious matters, and even belongs to a society for the discussion of liberal ideas.

What can we reasonably consider to be the content of the unconscious in the case of such an individual?

Considered from the above theoretical standpoint, everything in the personality that is not contained in the conscious mind should be found in the unconscious. Let us agree, then, that this man consciously considers himself to possess all the fine attributes we have just described—no more, no less. Then it must obviously result that he is entirely unaware that a man may be not merely industrious, thorough, and painstaking, but that he may also be careless, indifferent, untrustworthy; for some of these last attributes are the common heritage of mankind and may be found to be an essential component of every character. This worthy merchant forgets that quite recently he allowed several letters to remain unanswered which he could easily have answered at once. He forgets, too, that he failed to bring a book home which his wife has asked him to get at the book store, where she had previously ordered it, although he might easily have made a note of it in his notebook. But such occurrences are common with him. Then there can be no other conclusion reached but that he is also lazy and untrustworthy. He is convinced that he is a thoroughly loyal subject; but for all that he failed to declare his entire income to the assessor, and so, when they raise his taxes, he votes for the Socialists.

He thinks he is an independent thinker, yet a little while back he undertook a big deal on the Stock Exchange, and when he came to enter the details of the transaction in his records he noticed with considerable misgivings that it fell upon a Friday, the 13th of the month. Therefore, he is also superstitious and not a free thinker.

So we are not at all surprised to find here these compensating vices to be an essential content of the unconscious. Obviously, therefore, the reverse is true—namely, that unconscious virtues compensate for conscious deficiencies. The law which ought to follow as the result of such deductions would appear to be quite simple—to wit, the conscious spendthrift is unconsciously a miser; the philanthropist is unconsciously an egoist and misanthrope. But, unfortunately, it is not quite so easy as that, although