best shown by giving the actual values obtained in the "Probably good," "Doubtful," and "Probably bad" groups of cases.

TABLE II.

	Character of Fluid.	No of Cells (rough).	R. : L.	Polynuclears per Cent.	Micro-organisms.		Clinical Result.
					Films.	Culture.	
Prognosis "Probably good."	Bloody ...	500,000	45 : 1	70	0	0	Good.
	Bloody ...	500,000	45 : 1	57	0	0	Good.
	Bloody ...	1,250,000	20 : 1	73	0	0	Good.
	Bloody ...	1,250,000	500 : 1	79	0	0	Good.
	Clear ...	25,000	1 : 1.5	68	0	Staph.	Good.
Prognosis "Doubtful."	Straw, bluish	200,000	1 : 1	94	0	0	Bad.
	Orange, turbid	200,000	116 : 100	97	0	0	Bad.
	Straw, blood (bright) deposit	5,000,000	8 : 1	85	0	0	Good.
	Slightly bloody	100,000	3 : 1	87	0	0	Good.
	Orange, turbid, slight blood deposit	250,000	4 : 1	90	0	Bacilli	Good.
Prognosis "Probably bad."	Straw, light	500,000	(a)	100	0	Cocci	Bad.
	Bloody ...	1,000,000	21 : 1	91	0	0	Bad.
	Straw, deposit of pus	1,250,000	No reds	94	Cocci	Cocci	Bad.
	Bloody, mucopus	1,250,000	1 : 2	100	0	0	Bad.
	Bloody, ill-formed clot	1,250,000	10 : 1	93	0	0	Bad.
	Dark, bloody...	3,000,000	11 : 1	100	0	0	Bad.
	Yellow, dark	1,000,000	4 : 1	99	0	0	Bad.
	Yellow, blood deposit	500,000	2 : 1	100	0	0	Bad.
	Yellow, curdy deposit	800,000	(a)	96	0	0	Good.
	Yellow, mucopus	800,000	No reds	91	0	0	Bad.
	Bloody ...	1,000,000	(b)	(c)	0	0	Good.

(a) L. = many times R.
(c) ? (degenerated).

(b) Great leucocytosis.

From Table II it appears that an 80 per cent. polynuclear count marks roughly the dividing line between good and bad prognoses. Similarly, the dividing line is roughly indicated when cells are present in considerable numbers by the ratio reds to whites equals 20 : 1.

So far as concerns the bacteriological side of the investigations absence of micro-organisms from films and cultures of a knee-joint fluid is so common, although the nature of the injury makes it certain that some degree of infection must have occurred, that such absence, considered by itself, carries but little weight in forming the prognosis. On the other hand, the presence of even two or three short chains of streptococci or clumps of staphylococci in a large film, associated as it usually is with copious growth in cultures, is highly significant of a heavy and still active infection.

In twelve cases I have made two or more examinations, samples of fluid having been withdrawn from the joint at intervals. Such repeated examinations are at times very useful, as they indicate, of course, the progress of the local condition. A second sample, taken twenty-four hours after the first, may be enough to clear up a doubtful case and enable one to say whether the joint will settle down or not.

Finally, it must not be supposed that prognosis in these cases can be converted into a mathematical certainty. Balancing of the data obtained in the manner set forth above and formation of an accurate prognosis will still demand good judgement on the part of the pathologist. The attempt is worth making, for the frequency with which micro-organisms are neither found in films nor obtained by culture is evidence that the knee-joint has great powers of dealing with infection when the natural processes are not hindered by "physiological unrest." After penetration by a projectile a knee-joint is in a precarious condition, and the unstable equilibrium may easily be upset by a well-intentioned but ill-judged procedure to the disadvantage of the joint, possibly even at the cost

of limb or life. Though the method advocated is obviously susceptible of many improvements the proportion of accurate prognoses made thereby is sufficiently high to indicate its practical value in helping the surgeon to decide in a given case whether he will operate or whether he will forbear.

PSYCHO-ANALYSIS.

BY

CHARLES A. MERCIER, M.D., F.R.C.P.

READERS of the BRITISH MEDICAL JOURNAL know that I am not a fanatical devotee of psycho-analysis. I have so often questioned its principles and its methods that it may be supposed that I regard it as wholly useless. This would be a mistake. In my opinion psycho analysis performs a very useful function, which I will presently describe, and this being so, it is expedient that those who wish to avail themselves of its aid should know how to do so. At present there is no systematic exposition of psycho-analysis. There is a voluminous literature, but there is no systematic exposition. The writings of Freud and Jung, the chief priests of the cult, are disconnected, and from them we have to pick out the principles as best we can from among detailed records of individual cases. From this it has resulted that some of the most enthusiastic devotees of psycho-analysis have not grasped its principles.

It is true that psycho-analysis is past its perihelion, and is rapidly retreating into the dark and silent depths from which it emerged, but as it has in certain cases an unquestionable value, and as, moreover, the historian of medicine of the future will have difficulty in finding any account of it, it is well that it should be systematically described before it goes to join pounded toads and sour milk in the limbo of discarded remedies.

The first step towards the mastery of psycho-analysis is to obtain a command over its vocabulary, and the chief term used in the art is "The Unconscious." Upon this term the whole system is built, and it is therefore much to be regretted that there is no intelligible definition of it. Many have tried to define it, but no one has succeeded in producing a definition that is intelligible. This failure raises, of course, the *prima facie* presumption that the term has no meaning at all, that it is *vox et praeterea nihil*, and gives us the assurance that any meaning that does attach to the word is so misty, vague, and inchoate that to found practice upon it would be most unsafe. It may seem unlikely that men sufficiently intelligent to obtain positions as professors in universities would found a system of psychology and treatment on a notion so hazy and impalpable as to be wholly undefinable, but history, from Plato to Paracelsus, and from Paracelsus to Mill, shows that it has often been done, and no doubt it will often be done again. However misty and incomprehensible the notion may be, it seems that those who use the term as the basis of their system must attach some sort of meaning, if only a negative meaning, to it. I believe, though I speak with diffidence, that this is the case, and I shall try later on to explain the meaning that appears to attach to the term, as far as it has any meaning at all.

The next most important term used in psycho-analysis is "Libido." This has both an esoteric and an exoteric meaning. To the initiated it means lust, especially morbid and unnatural lust, incest, pederasty, bestiality, and so forth; but its exoteric meaning, as explained to those who are not fully initiated, and might be repelled by the esoteric meaning, is very different. To them it is explained as having the meaning of "wish," or "energy," or some other which is quite cleanly.

"Mentality" is another favourite term of the psychoanalyst. Its proper meaning is "mindness," which is of course nonsensical; but mentality does not sound as nonsensical as mindness. It sounds as if it meant something, and may be used when it is desired to strike an attitude, and impress the reader with a belief in the superior attainments of the writer.

"Oedipus-complex" and "Electra-complex" are other terms for incestuous lust. They are used for readers who are not fully indoctrinated with psycho-analysis, and might be disgusted with the plain term.

With this glossary, the student will be prepared for the study of psycho-analysis, and may now proceed to master its principles. Its basic principles are two: the principle of Sexuality and the principle of Conflict.

The first basic principle of psycho-analysis is that the key to every mental state, normal or morbid, is sexuality. On this principle we assume that every one of our thoughts has, whether we know it or not, a reference to sex; that every feeling has a sexual origin, every emotion a sexual nature, every act a sexual motive; that we live and move and have our being in an atmosphere of sexuality, which envelops us as completely as the physical atmosphere, from which it is just as impossible to escape, and of which we are just as unaware. However pure, innocent, and free from sexual colouring our ideas may appear to be, this appearance is delusive, for they are nevertheless steeped and saturated in sexuality. Nor is this sexuality which engrosses all our thoughts and feelings and prompts all our acts healthy and normal in character, if excessive in amount. It is distorted, debased, and depraved. Sexuality, like the letter H, is allotted to man with his earliest breath, attends him at birth, and awaits him at death. It is in sexuality alone that we live and move and have our being. The newborn infant, nuzzling against its mother's breast, has always been considered to be actuated by hunger, and to be seeking nourishment. The psycho-analyst teaches that this is a mistake: that the infant is actuated, not by hunger, but by a sexual attraction towards its mother. It is manifesting an incestuous craving. If we ask how the psycho-analyst knows this, we get no answer. He knows. He is the psycho-analyst. To question his assumptions is to shake to pieces the whole fabric of his doctrine. Therefore his assumptions are not to be questioned.

As soon as the girl baby is able to distinguish one person from another, she is consumed by a burning sexual passion for her father, a passion which clings to her throughout life, and dominates her career. When she grows up and falls in love, her lover attracts her not for himself, but for his likeness to her father, and is therefore always a person who resembles her father. In all her sexual relations with her husband, he is only taking the place that is really her father's, and it is with her father that she is all the time in imagination. In the case of a man, it is not his wife that he loves and with whom he has marital relations. She is but the inferior substitute for his mother, to whom he is vicariously married. Again if we ask the psycho-analyst for his ground for this assumption, we get no answer, unless it is an answer that he twists and wrings and distorts the results of his examination of this and that patient until they can be forced to appear to corroborate his assumption. The real ground of his assertions is that he is the psycho-analyst, and he knows.

These morbid and unnatural sexual thoughts and feelings are omnipresent in the lives of all. Everything solid that is seen, thought of, imagined, or especially dreamt of, and especially if it approximates to the cylindrical shape, has a sexual significance. It symbolizes the phallus. If we see or think of, and especially if we dream of, a ruler, a pen, the leg of a table, the trunk of a tree, or anything else that is solid—a house, a book, a hill, or any other solid object—we see, or think, or dream of it, not as itself, but as the phallus. Similarly, everything hollow, a tea-cup, a valley, the hold of a ship, the interior of a room, a railway carriage, a box, or a well, symbolizes the corresponding female structure, and suggests obscenity.

This is the first cardinal assumption on which psycho-analysis is founded. It is not stated by psycho-analysts as an assumption, however. They state it as an ascertained and certain fact.

It is commonly supposed that sexual modesty, reticence, and concealment are innate in human beings, and appear naturally at a certain early age, and at a certain stage of mental development; that they are instinctive, and arise from within. The psycho-analyst teaches that this is a mistake. Sexual modesty, and the conduct which it prompts are, according to him, the products of education. If we do not allow our thoughts to be occupied exclusively with obscenity, it is because we have been taught in early life to exercise an unnatural suppression and control of them. We are engaged in a life-long struggle to suppress

those sexual thoughts and feelings by which our minds are dominated. It seems to me that every one of us is as competent as a psycho-analyst to decide this question. We can all of us judge from our own recollection of our own early experiences, and from our own observation of the early experiences of other people, and it is not a fact that children are taught by their seniors to be sexually modest. The experience of us all is that sexual modesty grows from within, and is not implanted from without. The experience of all but psycho-analysts is that there is no struggle. The temptation to think of obscene things does not trouble us; we do not put forth any effort to suppress such thoughts; they are naturally abhorrent and disgusting to every one but a psycho-analyst; and no one but a psycho-analyst experiences any struggle in repelling and rejecting them. It is quite true, the psycho-analyst admits, that we are unaware of this struggle, that the temptation to obscene thought does not trouble us, and that we are not conscious of any effort to suppress such thoughts; but the reason of our ignorance is very simple. This is where the second cardinal principle of psycho-analysis finds its application. It is, in fact, to surmount this very difficulty that the second cardinal principle of psycho-analysis was invented.

The second cardinal principle of psycho-analysis is the existence and activity of *The Unconscious*. The reason that we are not aware of the terrible and vital struggle, in which we are all our lives engaged, to subdue the flesh, is that this struggle is carried on, not in our minds but in our unconscious; and it now becomes necessary to explain, as far as it is possible to do so, the meaning which psycho-analysts attach to this term. Up to the present it has been found impracticable to define it or to describe it in intelligible terms, but it plays such a preponderant part in psycho-analysis, and is so vitally necessary to the whole theory and practice of the art, that it is necessary to take pains to understand it. I am not sure that it is possible to understand it. I am not sure that it has any substantial meaning at all; but after prolonged study of the writings of psycho-analysts I have arrived at what is, I think, in their minds, and though the term cannot be either defined or described or explained, yet we may gain some approximation to its meaning by the help of illustrations.

The struggle in the mind between obscenity and chastity may be likened to a mutiny on board ship. Suppose such a mutiny, in which the crew are struggling to overpower the officers, and the officers are trying to subdue the mutinous crew. Suppose that you go on board the ship, and can find no sign of a struggle. Everything seems to be proceeding peacefully and orderly. The crew are to all appearance obeying the officers, and the officers are to all appearance in full control of the crew. It does not appear that any mutiny is taking place, and you are inclined to deny that there is any mutiny on that ship. You ask the nauto-analyst what reason he has to suppose there is a mutiny, and his answer is that you are altogether deceived by appearances. There is a deadly struggle going on, but you cannot see it because you are looking in the wrong place. What goes on in the part of the ship that you can see may be peaceful and orderly enough, but is of no importance whatever. *The mutiny is in the Overboard* of the ship, and what goes on in the Overboard is far, far more important than what goes on aboard the ship.

Take another illustration. You suffer from constipation, and you ask your doctor for a purge. The doctor happens to be a gastro-analyst, and he explains to you that what appears to you to be constipation is really dyspepsia, and is due to a violent struggle that is going on in your abdomen between the duumvirate, which is rebelling against the archæus, and the archæus, which is trying to overpower the duumvirate. "But, doctor," you say, "I have the digestion of an ostrich. I have eaten blubber with the Esquimaux, and baked leg of camel and couscousou with the Arab of the Desert. I could eat ragoût of old shoes, or stew of worn-out motor tyres without suffering from dyspepsia. There cannot be anything the matter with my digestion." "That," says the gastro-analyst, "has nothing to do with the case. You are suffering from terrible indigestion, but you do not feel it because the indigestion is not in your material stomach; it is in the Outbody, and what goes on in the body is of no importance at all. Your health depends entirely upon what is happening in the Outbody."

If we want to understand what goes on aboard ship, the

proper method is to study, not the behaviour of the crew, but the Overboard; if we want to understand what is going on in the body, the proper method is to study, not the processes going on in the body, but the Outbody; and if we want to understand what is going on in the mind, the proper method is to study, not the consciousness, but the Unconscious. Let us see, then, how the Unconscious is to be studied. It would appear from what we now know of the Unconscious that the study of it would be attended by certain difficulties; but fortunately, nothing in the world is easier. It is so easy that it appears positively childish; and the more we know of it the more childish it appears. There are two methods of investigating the Unconscious: the Verbal method, and the method of Dream-interpretation.

The Verbal method is to repeat to the patient a number of disconnected words, and instruct him to tell you what each word suggests to him. His answers come straight out of the Unconscious, and so afford us a clear insight into what is going on there. I know of no evidence to show that the answers come from the Unconscious, but it is important to recognize that in investigating the Unconscious we are altogether outside the realm of evidential knowledge. We are here dealing with matters of faith alone; and it would be as irrelevant and disrespectful to require evidence of the truth of what a psycho-analyst asserts, as to require evidence of the truth of the Koran. We are to receive his assertions with unquestioning faith, and to base our mental attitude towards him on that of Quintilian—*Credo quia impossibile*. We are to repeat to the patient a number of disconnected words, and ask him to say as rapidly as possible what other word is called up out of the Unconscious by the word we repeat to him. The words we repeat to him should not be arranged in any logical order, and should not convey any sense. This is a little difficult at first, but a short training in psycho-analysis enables us to speak without logic or sense. Let us suppose, for instance, that you say to your patient "How!" and that he has been instructed to reply by uttering immediately the first word that this suggests to him; and let us suppose that his answer is (as has actually happened) "Sow," or "Cow." This answer reveals as clearly as possible the direction of the sexual passion which is burning with fury in the Unconscious. The patient is in love with a sow or a cow, and is longing to mingle his embraces with those of the beast. He may not know it. He is certain to deny it, but we have now fathomed the depths of his mentality, and laid bare his Unconscious. Our task, however, is only begun. Of course, under the guise of a sow or a cow, the real object of his libido is his mother. We are therefore to examine and cross-examine him with respect to the character and appearance of his mother, and prove to him that in this respect and in that her resemblance to a sow or a cow is so close that all doubt about the identity is removed from his mind. This is of course the difficult part of our task. The patient's mother may be of dark complexion, and the sow or the cow may be a white one. This is because the struggle in the Unconscious is still proceeding, and the Unconscious is trying to elude our investigations and deceive us. He (or it) is full of cunning tricks and dodges, and unless we keep steadily in mind the necessity of tracing the patient's malady to incestuous passion, we may very easily be thrown off the scent. We must therefore continue to badger the patient with questions, suggestions, and cross-examinations until we conquer the resistance of his Unconscious, or until the patient becomes sick of it and refuses to put up any longer with our ministrations. It is in avoiding failure from this last cause that the skill and adroitness of the psycho-analyst are shown. If at length we succeed in wringing a confession out of our patient, we may, if we please, regard the cure as complete; but the more usual course is to continue the treatment as long as the patient will stand it, and as long as his funds hold out. I have known cases in which the patient has put up with bi-weekly and tri-weekly sésances for many months.

The second mode of investigating the Unconscious is by interpreting the patient's dreams. Dream-analysis is said by Dr. Jung to be the *real instrument* of psycho-analysis. The verbal method that has just been described is therefore not the real instrument; but still, it should be used, and the psycho-analyst does use it. The reason

that dream-analysis is the *real instrument* for searching out the Unconscious is that "the dream is a product that has a subconscious origin." It has been charged against psycho-analysts that they never give reasons for their assertions, but merely assert, and require us to accept their assertions. This cannot be said of Dr. Jung. "One objection has often been made," he says, "namely: Why should the dream have a subconscious content at all?" It seems a natural objection to make, and one that will occur to most people; and we are the more grateful to Dr. Jung for stating it so candidly and refuting it so conclusively. His refutation is complete. "This objection," he says, "is unscientific." That settles the matter. That is a smashing retort. Its value is that it is equally efficacious with every objection that can be raised against psycho-analysis. What reason have we for supposing that all the thoughts and feelings of every human being are saturated with sexuality? The objection is unscientific. How do we know that the baby at the breast is satisfying, not an appetite for food, but an incestuous passion? The objection is unscientific. What evidence is there that every woman loves her husband, not for himself, but for his likeness to her father, whom she perhaps detested? The objection is unscientific. No one nowadays has the audacity to confess himself unscientific, nor would his opinion carry any weight if he were so audacious. To say that the objection to any assertion is unscientific proves that that assertion is true, as Dr. Jung very well knows.

We are therefore to investigate the Unconscious by interpreting the patient's dreams. It may be objected that some people do not dream, or if they do, do not remember their dreams. The objection is unscientific; and to be candid, when I say that an objection is unscientific I mean that it is awkward, and would be fatal to my case unless it was disposed of; but then I am not Dr. Jung. Fortunately, I can dispose of this objection. Those people who say that they do not dream or do not remember their dreams are lying. They do dream, but they will not confess it. Their Unconscious is too many for them, and will not allow them to confess. It is the old story of the struggle in the Unconscious, the mutiny in the Overboard, the revolt in the Outbody. Every one does dream, and every dream has a sexual and incestuous meaning. To suppose otherwise would be unscientific. Take the following case:

An eight year old boy was brought to Dr. Jung to be cured of wetting the bed. Dr. Jung questioned the boy about his dreams, and found that "He dreamt very often of a black snake which wants to bite his face." The inference is clear and manifest. The boy "identifies himself with his mother, and proposes a similar relationship for himself with his father." That is owing to his homosexual component which feels like a woman towards the father. The wetting of the bed "must be regarded as an infantile sex-surrogate." "The infantile attitude here, it is evident, is nothing but infantile sexuality." Of course it is. Any other view would be unscientific. It is obvious that any other dream can be interpreted in the same way, if only we study it with the inflexible determination to find in it a sexual and incestuous signification, and if we remember that everything solid, especially if, like a snake, it is cylindrical, represents the phallus. Jung does indeed say that "it is quite incorrect to assume that the snake, when it appears in dreams, has a merely phallic meaning," but this admission has little or no effect on his practice.

Another patient dreamt that he was going upstairs, and "I shall now show you how," says Jung, "... this dream may be translated so that it has a sexual meaning." It is a difficult case, and requires the skill of a master to achieve the desired result, but a sexual meaning must be found. The dream must be so translated as to prove that it has a sexual meaning, or psycho-analysis will be at fault. Note the masterly ingenuity with which Jung discovers sexuality in this seemingly insignificant dream. "We know that the incest phantasy plays a prominent part in the life of a neurotic." Of course we know it. Have not Freud and Jung asserted it? To suppose otherwise would be unscientific. "The 'stairs' have a sexual meaning that is supposedly well established." Why supposedly? Why admit the intrusion of supposition among these certainties? "They represent the

sexual act because of the rhythmic climbing of steps." There we have it. There is proof incontestable. In the same way walking represents the sexual act, because of the rhythmic succession of steps. To suppose otherwise would be unscientific, that is to say, it would tell against psycho-analysis.

I have said that psycho-analysis performs a very useful function. By this I mean that it brings comfort, relief, and satisfaction to many a sufferer, and many who use it have reason to bless Dr. Freud and Dr. Jung. The sufferers I refer to are not those upon whom the method is practised, but those who practise it. The assumptions of psycho-analysis do approach the truth in this respect, that there are people who have strong sexual inclinations which they have no legitimate means of gratifying, and who are restrained by scruples of conscience from obtaining gratification by means that are straightforward and efficacious but manifestly immoral. Such persons are too conscientious to commit fornication, or to indulge in conversation that is frankly sexual and nothing else; but their sexual instinct craves for expression in some way. It is a god-send to them to be provided with a decent excuse for allowing their thoughts to dwell upon sexual matters and for freely talking and writing about them. Some, like the late W. T. Stead, find an excuse in "purity," and those who can remember *The Maiden Tribute of Modern Babylon* know how excessively rank purity can be made. As an expression of sexuality, the purity vein is worked out, for many conspicuous examples show that the subject can be discussed with perfect decency. Krafft-Ebing provided another excuse. Sexual aberrations were to be studied "scientifically," and under the cloak of science he indulged, and enabled others to indulge, in such orgies of beastliness that his mode of "scientific" investigation became discredited. The disguise wore too thin to be a disguise any longer. Freud, the successor of Krafft-Ebing, has been more astute than his master. He spreads his net much wider, and undertakes the treatment, not only of abnormal desires of a very repulsive kind, but of all mental and nervous diseases. This vastly extends the opportunities of the psycho-analyst, and enables him to discuss sexual matters with the utmost freedom with all his patients.

Not content with applying his ministrations to the unsuspecting adult man and woman, the psycho-analyst is now engaged in a most insidious effort to gain a footing in our schools, and contaminate the children. Thus says Dr. Jung: "Is it not a sacred duty to enlighten them [children] as to the shaky foundations of the so-called 'moral' conceptions of the past, which have only a dogmatic basis; is it not a duty to educate them into full freedom by courageously unveiling Truth? I ask this, not so much with regard to the analysing doctor as to the teacher. May not the creation of *free schools* be looked for as one task for the psycho-analyst?"

Here is a plain warning that cannot be misunderstood. We are warned in plain terms that the purpose of the psycho-analyst is to get hold of the children and undermine the foundations of their "so-called" morality. This campaign is already begun. Three or four long articles on psycho-analysis have already appeared in the well-known periodical *Child Study*, and other measures are being taken.

This is Kultur with a vengeance. For more than twenty years I have been demonstrating the rottenness of German teaching in mental disease, and during all that time I have been as the voice of one crying in the wilderness. There is no folly so egregious, no sham so transparent, that the alienists of this country will not gulp it down with greedy credulity if only it comes from Germany. The superstition that Germany is pre-eminent in mental disease is as deeply rooted and as irrational as the superstitions that she is pre-eminent in organization and in science generally. The last are now exploded. The whole world is at length ashamed at having so long suffered itself to be imposed upon by braggart boasting. Even Americans, the most gullible people in the world, as they are the most generous in giving intellectual credit, are realizing that Kultur is a sham, and the miraculous German capacity for organization and for scientific discovery an imposture. It is left for the alienists of this country, and for a little tail of other physicians, to be the very last to cling to an exploded superstition. I do not hope that anything I have said in this article will have any effect on them. The man with the muck-rake was deaf to persuasion, and refused to lift up his eyes unto

the hills; and no doubt the psycho-analysts will continue their raking in the muck; but it is as well that those who hear their noisy propaganda, and take for granted that there must be some sense at the bottom of it, should learn the true state of the case, and should know of the attempt that is being made to corrupt the rising generation.

CERTAIN POINTS OBSERVED WITH REGARD TO CEREBRO-SPINAL FEVER IN THE BELFAST MILITARY DISTRICT DURING 1915 AND UP TO NOVEMBER, 1916.*

BY

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EPIDEMIOLOGY.

Cases of cerebro-spinal fever were not recognized in the Belfast district until several months after their occurrence amongst the troops in England. New huts had been erected and were in occupation before the disease made its appearance. There was no overcrowding, and on the whole the general sanitary condition of the camps was good. The chief defect in the district was the wet and muddy condition of the ground in the neighbourhood of the huts. The first case was discovered at Randalstown Camp on February 17th, 1915. The winter was not severe, but there were great and sudden variations in temperature, and many cases of colds were observed, especially in the spring of 1915. During colds great numbers of diphtheroid bacilli are often found in the nasopharynx, and the presence and effects of these would appear to be either inimical to the meningococcus or to render its recognition in culture plates more difficult.

In 1907-8 an extensive epidemic of cerebro-spinal fever occurred in Belfast, and from 1907 almost every year a few cases were discovered. In 1914 there were four cases. During the epidemic in Belfast sporadic cases occurred in the neighbouring towns and villages. It is noteworthy that in this epidemic and in that of 1907-8 Londonderry and the north-west of Ireland remained free from the disease. If we can assume that carriers were absent from this district, some information may be available as to the incubation period of the disease when the history of a visit to Belfast of a soldier stationed in this northern district is considered. Pte. J. O'B., 4th Batt. Royal Inniskilling Fusiliers, left Clonmany, a camp in the Innishowen peninsula, co. Donegal, on April 17th, and reached Belfast the same evening. At this time cases of cerebro-spinal fever were occurring amongst the civil population in Belfast. Pte. J. O'B. presented symptoms of the disease on April 22nd, and was admitted to hospital on April 24th. This seems to point to an incubation period not exceeding four days. It is probable, however, that cerebro-spinal fever resembles pneumonia in having no definite incubation period. The history of one of our contacts, who afterwards developed the disease, led us to infer (1) that a susceptible subject may have meningococci in his nasopharynx for a fortnight and yet not develop the disease; (2) that the same individual, months later, may be severely attacked. Evidently the virulence of the cocci, or the resisting power of the individual, are of far more importance than the presence of the cocci in the body for a definite period.

As regards the source of infection in this outbreak, it is probable that it was not introduced from England or Scotland, but was due to the persistence in the nasopharynx of certain members of the population of meningococci which had caused the 1907-8 epidemic. One of our "carriers" harboured the meningococcus for five months, and it is easy to conceive that such chronic carriers and a few cases of the disease could bridge over the seven years between the two outbreaks. As already mentioned, a few cases of the disease also occurred every year. The first case occurred at Randalstown Camp, and it was thought that the infection might have been acquired in that

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