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WAR PSYCHOSES—THE INFECTIVE-EXHAUSTIVE
GROUP.

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IN the official nomenclature of mental diseases in use in the British army no place was found for the infective-exhaustive group, but instead we were given a choice of three different groups, *e.g.*, acute delirium, insanity associated with acute infective disease, and confusional insanity which was held to be synonymous with exhaustive psychosis. Such a multiplicity of terms seems quite uncalled for, and from the point of view of understanding the cases, of statistics, and of diagnosis, the situation would seem to be much more satisfactorily met by the use of a single, more comprehensive term, *e.g.*, infective-exhaustive psychosis. If the above terms had been used correctly, and if their meaning had been clearly defined, then

fewer discrepancies would exist, but at present there seems to be so much doubt in regard to their meaning that we see almost any kind of case labelled as confusional insanity, and to a lesser extent as exhaustion psychosis, while the term insanity associated with acute infective disease is seldom used; on the other hand, we see straightforward examples of the infective-exhaustive psychosis called delusional insanity, melancholia, or what not. From the cases one has seen, and from the diagnoses given, it would really seem that the term "mental confusion" is much more an index of the mind of the doctor making the diagnosis than of the patient's mental state; it is like the use of the term "eczema" in skin diseases—anything is "eczema" which cannot be diagnosed. The term "acute delirium" is also simply a symptomatic one, and it can surely be said that the majority of deliria are infective-exhaustive in origin, and, naturally, would come to be included under such a grouping. Of all the above terms, the one which has played the greatest havoc in the classification of the war psychoses, and which has come to be used most generally, is "confusional insanity." At the risk of being considered trite, I would like to urge that "mental confusion" can only be legitimately used as a descriptive term where the patient is totally disoriented for time, place, and person; it means that the patient's consciousness is clouded, and that he has an imperfect realisation of his environment. Such a condition can by no manner of means be designated a distinct entity, as such a type of confusion may occur *as a symptom* in almost any form of mental disturbance, *e.g.*, general paralysis, arterio-sclerotic brain disease, dementia præcox, post-traumatic states, infective-exhaustive states, &c. The person then making such a diagnosis as "confusional insanity" is simply tending to hoodwink himself, and is not taking the trouble to look for the underlying cause of the mental confusion. Such a state of affairs is unfortunate, as under the circumstances it is quite impossible to obtain either uniform case records or accurate statistics. The importance of the subject may be gleaned from the fact that Richards in his review of the cases admitted to the Government Hospital for Insane, Washington, during the period 1899-1908, showed that toxic etiological factors were present in 28.6 per cent of 1,102 military mental cases. The Great War

furnished us in this country with such an unique opportunity of coming into contact with this material that I have thought it advisable to attempt to formulate my experience.

The present report is based on a series of 115 personally examined cases who were invalided principally from Mesopotamia and Salonica, and, to a lesser extent, from India and Egypt.

Before entering into an analysis of the actual case material, one or two more general points will bear a moment's discussion. It is a well-recognised fact that the recovery-rate in this group of cases is unusually high, and the patient usually becomes mentally just as normal as he ever was. Often by the time these patients arrived in England they were convalescent, and it was in consequence unfortunate that "D" Block, Royal Victoria Hospital, Netley, was simply a distributing centre. No cases could be discharged from "D" Block to duty, home, &c., but instead all cases had to be transferred in the course of a few days to special Military Hospitals for mental cases. In many cases this was a distinct hardship, as it seems to me there is no more reason for transferring such cases to mental hospitals than, say, patients suffering from a temporary delirium due to such a disease as pneumonia. When I say this, I am not evading the fact that during the acute phases of their illness these patients need careful watching and nursing due to the great risk of suicide; but the acute phase is, in the majority of cases, a transitory one, and it should be possible to arrange special wards in connection with general hospitals to meet any such emergencies. Another point is that after recovery a number of these patients feel that they have been unjustly treated, that a stigma has been attached to them, and that a blot has been put on their lives which never can be wiped out, and which will seriously interfere with their promotion in whatever walk of life they are employed. No doubt opinion has changed, and is changing more and more in regard to mental disorders and their treatment, but there is still no gainsaying the fact that the man who has suffered from any form of mental disorder is viewed with suspicion, and an employer thinks twice before placing any such man in a position of responsibility. In addition, I wish to enter a protest against the plan of returning men for service to tropical climates who have already suffered a mental breakdown from

malaria, dysentery, or other tropical disease. Instead of being immune, these men seem to have become much more susceptible, and quickly break down again.

I wish now to pass on to a consideration of the actual case material.

ETIOLOGY.

Sir Patrick Manson in his well-known text-book on *Tropical Diseases* speaks as follows:—"The malarial parasite is by far the most important disease-producing agency in tropical pathology. Not only does it give rise to grave and sometimes fatal fevers, but in consequence of its prevalence, of its anæmiating and debilitating influences, and of its tendency to cause congestion of the abdominal viscera, it undermines the health of millions, predisposing them to other diseases which it complicates and aggravates, impairing the powers of resistance and repair, and otherwise unfitting them for the active business and enjoyment of life. Directly and indirectly it is the principal cause of morbidity and death in the tropics and subtropics."

What Manson says in regard to malaria in general is well brought out by the present group of cases, as the psychoses due to malaria largely predominate. This, however, seems to be due much more to the general prevalence of the disease than to any special predilection of the malarial parasite to attack the central nervous system.

In the cases which have been caused by a combination of toxic factors it has been quite impossible to say whether any one of these factors has been more specific than another, but irrespective of the agent or agents, the type of psychosis has been identical.

In the great majority of the cases the relation between cause and effect has been quite clean cut, and the usual history has been that up until the onset of the fever the patient had enjoyed good health. In some of the cases the fever has seemed to act as the precipitating factor of latent trends, has brought to light an underlying mental disorder, and has been, for instance, the cause of many cases of mental deficiency showing disorders of conduct. Wherever the evidence pointed conclusively to the

fact that the patient had previously been abnormal the case has not been included in the series.

Another etiological factor of considerable importance, but one difficult to estimate, has been the effect of what is variously termed "heat stroke," "heat exhaustion," or "climate." Manson has stated that taking one form of heat stroke with another the case-mortality of English troops in India is about one in four. Death in these cases is suddenly brought about by a paralysis of heart and respiration, being really in the nature of a shock as from a blow. In other cases a syncope is caused, or at times a febrile condition characterised by headache, vomiting, intolerance of light and movement, and hyperpyrexia. In the majority of cases that I have had to deal with it has been notoriously difficult to obtain a satisfactory history, and one has had to be content with such statements as—"I've had a touch of the sun," or "It was the climate, sir." In a few cases a history has been obtained of a definite heat stroke with hyperpyrexia and coma. It would seem reasonable to assume, however, that a number of those cases showing toxic symptoms, but with negative bacteriological findings, are essentially due to "sun exposure" or "climate." Whatever value sun exposure may have as a primary cause, I have no doubt whatever that it has been a very large contributory factor in the development of psychotic symptoms.

Another point which requires special mention is as to whether *exhaustion* in the sense of pure physical exhaustion—apart from heat exhaustion—is of any importance as an etiological factor. Farrar believes that "we have been making too free with the diagnosis 'exhaustion psychosis.'" He quotes Bonhoeffer as being unable to find evidence of its occurrence as the result of conditions of warfare. He also quotes Aschaffenburg as denying any etiological importance in the psychoses to the exhaustion element, and as declaring that he has seen no case in which any psychic disturbance worth mentioning has resulted from exhaustion. In this connection it was striking to note the excellent physical condition of the majority of mental and nervous cases evacuated from the various seats of war, and, personally, I have not seen a case which could be labelled "exhaustion psychosis." As a secondary etiological agent,

however—following fever—I believe the factor of exhaustion must still be seriously reckoned with.

SYMPTOMATOLOGY.

Bonhoeffer (quoted by Southard) believes that so far from there being a one to one correspondence between toxins and entities (which Kraepelin maintains) that, on the contrary, the most varied causes in the infective-exhaustive group yield a comparatively small gamut of symptom pictures and no very great variety of course and outcome. Deliria, epileptiform excitements, dazed and stuporous conditions, hallucinoses, and hallucinatory catatonic or incoherent amentia (in Meynert's sense) are, according to Bonhoeffer, the main clinical forms. In the later states one may see mental weakness with emotional hyperæsthesia, amnesia of the Korsakow type, and in severe and fatal cases delirium acutum, meningitis-like phenomena, and occasionally developmental defects in children. Richards has described the toxic-exhaustive states as being of short duration, as arising in connection with bodily disorders, and as being characterised by confusion, motor excitement, with a tendency to violent, harmful acts, and a tempestuous course. He has, however, been content to describe 56 per cent of his cases as depressed, 20 per cent as excited, and 15 per cent as confused, or apparently demented. Porot and Gutmann, in a recent paper on the "Malarial Psychoses," emphasise the occurrence of the following features:—(1) Mental confusion, which may be followed by a manic-depressive or demented phase; (2) depression and asthenia, both of which may become very marked; (3) somatic nervous disorders, *e.g.*, loss of reflexes, evidence of general polyneuritis, tremors, convulsions, and meningeal syndromes.

The analysis of the present group of cases unquestionably confirms Bonhoeffer's view that it is quite impossible to describe one group of symptoms for the psychoses due to malaria, another group for dysentery, and so on. All the different toxic factors which have played a part in the production of my cases have given rise to similar symptom pictures.

Neither Richards nor Porot nor Gutmann seem, in the

enumeration of symptoms, to do justice to the actual facts, while the striking feature in Bonhoeffer's description is the fact that he fails to mention *depression* as a prominent symptom.

TYPES.	Malaria.	Dysentery.	Enteric.	Influenza.	Sandfly Fever.	Enteritis.	P.U.O.	Dengue.	Heat Exhaustion.	Septic Wounds	Gas Poisoning.	Pericarditis.	Otitis.	Mixed.	Totals.
1. Dull, apathetic, and depressed.	1	3	2	..	..	..	..	1	3	..	..	..	..	3	13
2. Depressive hallucinosis.	9	..	..	1	1	..	..	..	5	..	..	..	1	2	19
3. Mania.	..	2	..	..	..	..	..	..	..	..	..	..	..	..	2
4. Irritable, suspicious, delusional, hallucinatory.	12	3	..	3	..	..	..	..	3	..	..	..	..	5	26
5. Stupor.	1	..	..	..	..	..	..	..	..	..	..	..	..	2	3
6. Delirium.	17	3	3	3	1	..	2	..	2	5	..	1	..	5	42
7. Wandering, forgetful, amnesic.	4	..	..	..	..	..	1	..	..	..	1	..	..	1	7
8. Korsakow syndrome.	..	1	..	..	..	1	..	..	..	..	..	..	..	1	3
Totals, . .	44	12	5	7	2	1	3	1	13	5	1	1	1	19	115

I wish to discuss very briefly the various symptom pictures which, in the present group of cases, have stood out most prominently.

1. *Delirium*.—This is undoubtedly the most striking as well as the most characteristic and most frequent of all the symptom pictures exhibited by the toxic-exhaustive psychoses. Forty-two cases, or approximately 36 per cent, belong to this group, made up as follows:—17 cases of malaria, 3 of dysentery, 3 of typhoid fever, 3 of influenza, 1 of sandfly fever, 2 of P.U.O., 2 of heat exhaustion, 5 of septic wounds, 1 of pericarditis, and 5 due to a combination of infective-exhaustive or toxic factors.

In all of these various conditions the symptom picture was essentially of the same type. The usual history was one of gradual physical exhaustion with restlessness, sleeplessness, irritability, headache and giddiness, terrifying dreams, and a feeling of being mixed up in the head. As the condition

progressed the patient became disoriented for time and place, illusions and hallucinations of sight and hearing appeared, fear was almost invariably present, and suicidal attempts were not uncommon. Gradually, as the fever subsided, the disorientation, the fear, the hallucinations, &c., began to disappear, the ability to sleep returned, the patient acquired insight into his past condition, and recovery was usually complete. During the period of convalescence feelings of depression, apathy, poor memory, and lack of confidence were always striking phenomena. A typical case history may be given:—

A private, 22 years old, on 17th September, 1916, while with his regiment in the Vardar Valley, complained to his medical officer of headache, pains throughout his body, and cold shivers; his temperature was 102°. On 21st September, 1916, at a General Hospital in Salonica, his temperature was 100·8°, his spleen was palpable and tender, and he was in a semi-comatose condition. Later, he became quite delirious, he was frightened, was totally disoriented for time and place, and had hallucinations both of sight and hearing. He became suspicious, thought his comrades were accusing him of "swinging the lead," and that they were threatening him. While arrangements were being made to have him carefully watched, he tried to commit suicide by slashing his throat with a razor.

In November, 1916, on his arrival in England, he appeared to have regained his normal mental condition. His memory was good, he had an excellent appreciation of what he had passed through, and expressed sorrow for having attempted his life. Physically he had tremor of tongue, hands, and facial muscles, and hyperactive tendon reflexes, but otherwise there were no neurological symptoms, and no disease of his organs.

Previous to going to Salonica this patient had been on active service in France, and up until the onset of his fever had enjoyed robust health.

He was discharged from hospital in a completely recovered condition.

2. *Irritable, suspicious, deluded.*—Twenty-six cases belong to this group—12 of malaria, 5 due to a combination of toxic factors, 3 due to dysentery, 3 due to influenza, and 3 to heat

exhaustion. The following case is a fairly typical example of the group:—

A gunner, 33 years old, on 10th November, 1917, was admitted to a General Hospital with headache, diffuse pains throughout his body, and a history of two previous attacks of malaria. The examination of his blood-film showed the benign tertian parasite. While in hospital he became restless, irritable, and excitable. He accused the sister in charge of the ward of attempting to murder him, said that he could hear voices, and that he was being watched. On 16th December, 1917, while in hospital in India, he was described as having delusions of suspicion and persecution, and aural hallucinations. On 11th March, 1918, when admitted to "D" Block, Royal Victoria Hospital, Netley, he stated that his head felt quite clear, he was able to give an excellent account of himself, no delusions or hallucinations could be elicited, and he had a good realisation of his illness.

This soldier had served for one year in France, and in November, 1915, was transferred to East Africa. In May, 1917, he was invalided to England with malaria. During his period of eighteen months in East Africa he had had numerous attacks of malaria, and altogether had been in hospital for eleven out of the eighteen months. Despite his history, in August, 1917, he was sent to Mesopotamia, and within three weeks after his arrival at Basra he was again stricken down with malaria, and was again evacuated to England.

Another case which tends to emphasise the difficulty of diagnosis in this group of cases, and which clearly shows the bringing to light of a dementia præcox trend, is as follows:—

A lance-corporal, 21 years old, on 30th October, 1916, at Alexandria, was described as depressed, emotional, and lacking in self-possession. On 25th November, 1916, on admission to the Lord Derby War Hospital, he stated that he thought there must be something wrong with his mind, because whatever he said seemed to be transmitted to other people. He thought all this was done by wireless. When he was reading a book he could hear whatever he might be reading being spoken aloud by some of his comrades, voices seemed to repeat his thoughts, and to put both good and bad thoughts into his mind. He felt unable to

write letters owing to the fact that everybody seemed to know what he was writing.

This soldier had suffered in October, 1915, at the Dardanelles, from septic poisoning and dysentery. In February, 1916, he went to Mesopotamia, but after a few months he became so affected by the sun that he had frequent fainting attacks, and developed jaundice. On that account he was invalided to Bombay, and it was while he was in this condition of physical ill-health that he developed hallucinations and ideas of thought-reading.

During the time he was under my observation in hospital his ideas of influence persisted, while his memory and general intellectual functions were intact. He had always done well at school, and in civil life he had worked steadily as a silversmith. There seems no reason to doubt that this case arose directly on the basis of his physical illness, but the persistence of his psychotic symptoms would tend to make one think of a dementia præcox reaction type precipitated by a toxic agent.

3. *Depressive hallucinosis*.—Nineteen cases are included in this group. The group is not a clean-cut one, as, on the one hand, some of the cases resemble a delirium, and, on the other hand, some of them approach the irritable, suspicious, deluded group.

As the name of the group implies, however, these cases are in the nature of acute hallucinoses with marked depression, and accompanied by a striking element of fear. During the course of the illness these cases, for the most part, remained closely in touch with their surroundings, and were not disoriented for time and place. As a general rule, the hallucinosis ran an acute, transitory course; recovery occurred, with good insight into the nature of the disorder, and often by the time the patient had reached England he was convalescent. This type of disorder was especially prominent in the cases of heat exhaustion and of malaria. It is interesting to remark that out of the total of 13 cases of heat exhaustion, depression in one form or another was present in eight instances. Two typical cases are detailed:—

1. A private, 28 years old, on 17th October, 1916, was admitted to a General Hospital at Salonica, with melancholia. He had

had malaria, and on that account had become unbalanced. He was very depressed, and constantly heard voices saying that he was going to be shot, and these voices eventually became so persistent that he made an attempt to shoot himself. He was found with his rifle in his possession, one cartridge having been fired; his forehead was slightly grazed, and there was discoloration around the orbit. On 27th November, 1916, on admission to the Lord Derby War Hospital, he still complained of feeling depressed, which he explained as being due to malaria. There was no psychic retardation, but he complained of inability to sleep at night on account of depressing thoughts in regard to what would be done to him. He asserted that he had heard his comrades say they were going "to do him in," and said—"That is why I shot myself, sir." He was unable to distract his mind from what he had done, and from the thought of the punishment which would be meted out to him. He frankly admitted having attempted to kill himself, but stated that at the time he was irresponsible, and not thoroughly conscious of what he was doing. He was correctly oriented for time and place, his memory was good, he acquired insight into his condition, and made a good recovery.

2. A sapper, 32 years old, in 1914 contracted enteric fever in India, but following this he served for seventeen months in Mesopotamia. In June, 1916, he had heat stroke. He was not unconscious, but suffered from pains in his head, was treated with ice applications, and for two days had very little appreciation of time or place. He developed malaria at the same time, and after a number of months' treatment in a convalescent camp he was, in July, 1917, returned to India. Following this he had several relapses, and became reduced in weight from 12 st. 7 lb. to 9 st. 12 lb. He became depressed and melancholy, suffered from insomnia, was disturbed, nervous, and frightened by any sudden noise. He lost all confidence in himself, was frightened for the shadows, and often would imagine people were following him and talking about him. He even seemed to hear his comrades making plans to kill him. On 11th March, 1918, on admission to Netley, he was still dull, but gave the above account of the onset and development of his illness. He was slow in replying to questions, felt apathetic, lacked confidence, and was

pessimistic in regard to his future. During the few days he was under observation he reacted well to reassurance, and seemed willing to adopt the medical viewpoint.

4. *Dull, apathetic, depressed group*—Thirteen cases belong to this group. In all of these cases the depression was in the nature of a dull, apathetic, uninterested state, with a certain amount of slowing down, both mentally and physically. Frequently there was a condition of difficulty in concentration and attention, and in a few cases there was a certain clouding of consciousness and forgetfulness. The whole condition seemed to be largely determined by the physical ill-health and weakness of the patient, and this state largely predominated in cases undergoing a slow convalescence. A case in point is as follows:—

A gunner, 21 years old, in October, 1916, in Mesopotamia, developed enteric fever. During the course of his illness he is described as showing mental symptoms. He was melancholy, lay in bed with his eyes closed, wept, refused food, and tried to commit suicide by drinking methylated spirits. He frequently said that he wished to be shot. In March, 1917, at the Lord Derby War Hospital, he still complained of feeling weak, worried, and low spirited. He denied ever having had any hallucinations or delusions, but he admitted that at the time of his evacuation from Mesopotamia his mind was clouded, and he was unable to take any interest in anything. He was in a weak, emaciated condition, but there was no evidence of any organic disease. Eventually he made a good recovery.

5. *Stupor*.—Belonging to this group we have only three cases, one due to malaria, and two due to a combination of toxic factors. Such a small number of cases of stupor is rather amazing, and is in contrast to the experience of others. Possibly it is due to my not seeing the cases in the incipient and acute stages of the disease.

1. The case due to malaria was a private, 25 years old, who had a history of rigors, ran a temperature which at times reached 104°, and during the acute phase of his illness was treated with intramuscular injections of quinine, and was also given quinine

by the mouth. He was dull, restless, and stuporous, and during the whole time of his residence in the hospital it was impossible to get him to answer questions or to co-operate in an examination.

2. A private, 20 years old, in the first week of August, 1916, was treated in hospital for eleven days on account of heat exhaustion. A day or two later, following his discharge from hospital, he fainted when on guard in the trenches, and became dazed and dull. He only occasionally would answer questions; he was wet and dirty in his habits. On 20th August, 1916, he had a pyrexia of 107° , and crescents were found in his blood smear. In September, 1916, on admission to a hospital in India, he was found to be suffering from dysentery. On 30th November, 1916, on admission to the Lord Derby War Hospital, he was in a dull, uninterested, stuporous state, never spoke spontaneously, and when questioned replied usually in monosyllables. He complained of headache, felt dizzy, and was unable to give very much account of his illness. He was approximately correctly oriented for time and place, his power of retention was good, and his memory for recent events was intact. During his hospital residence he acquired insight and showed a steady improvement.

The remaining case had practically recovered by the time he was admitted to hospital in this country.

6. *Mania*.—Overbeck Wright, in his text-book on *Mental Derangements in India*, has stated, in considering the relationship between malaria and insanity, that "the maniacal condition is certainly the most common," but he, unfortunately, does not give any case records to substantiate his statements. The condition he describes is much more akin to delirium than to mania.

The only two cases I have met with in this series were associated with dysentery. Both of these cases had had in civil life previous attacks of excitement and depression, so it is probable the dysentery was simply the precipitating factor of the present attack. The present group of cases seems to show that a manic-depressive psychosis as a reaction to toxic factors is relatively infrequent.

7. *Korsakow's syndrome*.—As is well known, Korsakow's syndrome consists of a peculiar state of confabulation, an inability to form new associations, a poor memory for recent events, combined with a more or less generalised peripheral neuritis. Korsakow first described it as occurring in cases of chronic alcoholism, but it may occur in any severe toxic-exhaustive state. In a previous paper on "Six Unusual Cases of Memory Defect," I have reported in detail three cases which occurred following malaria and dysentery. In addition to the above full-fledged cases, I have come into contact with a number of other cases which can only be described as *forgetful, wandering, amnesic states*. Such cases cannot be looked upon as examples of the Korsakow syndrome, but owing to the fact that the principal symptom they showed was a very striking forgetfulness and retention defect, I have thought it best to include them under the general heading, As an example of the condition, I wish to report the following case:—

A sapper, 24 years old, on 12th October, 1917, was admitted to a General Hospital at Wynberg, South Africa, from British East Africa, suffering from "dysentery and debility." On 9th November, 1917, on a hospital ship, he was described as follows:—"Malaria and dysentery. Has been becoming confused and somnolent, apathetic, no idea of time or place, wet and dirty in his habits; got out of bed and commenced shouting in Welsh to another patient." On 14th December, 1917, on admission to "D" Block, Netley, he was quiet, respectful, was grateful for any attention, and behaved in a natural way. He answered questions promptly and to the point, and when asked about his complaint said, "I seem to have had an attack of dysentery which has affected my brain." He did not show any special emotional disorder, but expressed himself as feeling mixed up in his head—"I feel as if I was just waking out of a sleep." He could not tell when he enlisted ("I am awfully sorry I can't recollect"), how long he had been in training, or when he went overseas. He had a very hazy recollection of having been in British East Africa, but could not recall any of his experiences there. He gave the year and the place correctly, but he could not tell the day nor the month. His striking defect was his poor power of retention, which was repeatedly tested by repetition of numerals, by giving

him a name, colour, place, &c., to remember. He did not confabulate, however, but simply said—"I don't know," or "I can't remember." He had a fair appreciation of his own difficulties, and was greatly concerned lest he should not recover.

His father informed me that the patient in civil life had always been a strong, healthy, intelligent boy. A former school-master, and the chief clerk at Carnarvon Post Office, where he had previously been employed, corroborated his father's statements, and said that the patient had always been an exceptionally bright lad.

Physically, he was in fair general health, and did not show any neurological symptoms. During the few weeks I had him under observation his memory defect did not show any special improvement.

GENERAL CONSIDERATIONS.

In the group of cases which has been brought together a large variety of symptom pictures has been seen, all directly due to definite etiological factors. Each patient has reacted towards the situation by showing the type of symptoms which a study of his personality would, no doubt, have led one to expect, so that although the malaria, dysentery, or what not was the direct cause, yet it was simply the exciting factor, and otherwise had no etiological significance. There does not seem to be any special predilection for the diseases mentioned in this paper to attack the nervous system, rather are these conditions due to the general prevalence of the different diseases, and the individuals affected are those whose nervous systems are inferior, and in consequence are specially liable to be attacked by any agents—physical, chemical, or mental. Hoch tackled the problem in a somewhat different way, and in a paper on "The Problem of the Toxic-Infections Psychoses" has shown that the mind responds to influences which disorder its functions in three main ways—(1) organic reactions, (2) affective reactions, (3) trend reactions. He has pointed out that organic reactions are characterised essentially by defects of memory and retention, *e.g.*, delirium; the affective reactions are characterised by disorders akin to normal affective states, *e.g.*, manic-depressive; while the trend reactions are those in which Freudian mechanisms show them-

selves, *e.g.*, dementia præcox. To my mind the above differentiation is a very arbitrary one, because all these various types of reaction are closely associated and combined in practically every case. In any delirium one sees not only organic features, *e.g.*, memory and retention defect, but also affective and trend reactions. It is true, however, that certain symptoms predominate in each individual case, depending on the inherent constitution of the individual. This has been emphasised in the types of case described.

I would only mention further that the prognosis in this group of cases is, on the whole, excellent. In this series of 115 cases the recovery-rate was 70 per cent. The cases which run the most protracted course, and which tend to show permanent residuals, are those exhibiting dementia præcox and Korsakow symptom pictures. In the Korsakow types there is almost invariably a permanent memory defect.

In conclusion, allow me to emphasise the following points:—

1. The most satisfactory and comprehensive classification for all this group of material is the infective-exhaustive reaction type; the term "confusion" should be definitely avoided, unless the exact form and meaning of the term is defined.

2. Exhaustion as a primary factor in the causation of mental illness has probably been over-rated, whereas as a contributory factor it is of the greatest significance.

3. The most varied infective-exhaustive factors produce a uniform symptom picture showing several main types, depending largely on the innate characteristics of the individual, *e.g.*—(1) delirium; (2) irritable, suspicions, deluded state; (3) depressive hallucinosis; (4) dull, apathetic, depressed group; (5) stupor; (6) mania; (7) Korsakow's syndrome.

4. The principal lesson to be learned from a study of this group of cases is the inadequacy of the facilities in this country for dealing with acute mental disorders. They prove conclusively the necessity for the establishment of either special wards in connection with general hospitals or of special psychiatric clinics.