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Part I.—Original Articles.

Epidemic Encephalitis: Some Psychical Sequelæ.[1]

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INTRODUCTION.

NUMEROUS observations have lately been recorded in medical literature on the acute manifestations of epidemic encephalitis; but the late after-effects, especially those of a psychotic nature, have been seldom described. Kirby and Davis (1) have emphasized this, and have recorded 18 cases in their early and later stages. They remark that "a satisfactory solution of certain of the psychiatric problems presented by this disease will require a longer period for clinical observation of cases than has elapsed since the appearance of the epidemic of 1918–19." The following series of 10 cases is offered as a contribution to the clinical records of the sequelæ of the disease, especially from the psychiatric point of view. Eight of them originated in connection with the epidemic of 1918–20. The remaining two are of remoter origin, and are admitted on account of their close resemblance to the others, and of their special interest from the point of view of classification and prognosis. Five of them (3, 5, 6, 9 and 10) are, or have been, in mental hospitals. In this connection the only statistics available to me are those quoted by Kirby and Davis (*loc. cit.*) for the New York State Hospitals in the hospital year from July 1, 1919, to June 30, 1920, when, out of 6,500 admissions, only 20 were considered to be probably cases of epidemic encephalitis. (But the epidemic was subsiding at that time.) The 5 cases mentioned should therefore be of considerable interest; and it is one of the purposes of this paper to show that a more thorough knowledge of the results of this protean disease would lead to its being diagnosed more frequently among the cases, even those of very long residence, in mental hospitals.

[1] Being an essay for which the author was awarded a special prize of £5 by the Association.

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There has been a tendency among writers on the disease to divide the cases into psychotic and neurologic forms, according to the predominating features. Kirby and Davis are right in insisting that each case be considered as a whole, otherwise, in extending observations to cases where the symptoms of origin, as frequently occurs, are atypical, mistakes in diagnosis must arise. With this caution in mind, it is convenient to take up the psychiatric aspect of the following series first of all, and thereafter to deal more briefly with the neurological signs.

Literature.—Hohman (2) reports 23 cases. Most of these were observed in the acute stages, but some of them ran a chronic course, and for that reason his findings may be summarised here. He distinguishes nine syndromes which he considers characteristic:

(i) Great pressure of talk without distortion of stream of talk, and without mood alteration—persisting in one case at the end of five months. (ii) Euphoria—in one patient continuing for a year after the onset. (iii) Alertness and mental clearness immediately on arousal. (iv) Delirium. (v) Stupor. (vi) Behaviour oddities. (vii) Depression. (viii) Emotional instability and irritability. (ix) Memory defect. Of these (iii), (iv) and (v) were found only in the acute (early) stages. The remainder occurred also in one or other of the more chronic cases.

Hohman also describes four reaction types: depressive, psychoneurotic, delirious and organic. The depressive reaction was observed in only one chronic case. The psychoneurotic and delirious types were seen only in the early stages, but an organic reaction was observed in 4 chronic cases. Of these 4 cases, however, 2 had an intermittent pyrexia over the entire period of observation.

Bonhoeffer (3) records anxiety in the first few days, and long-continued psychotic manifestations, especially types resembling cocainism. He found no intellectual defect in any of his cases.

Mingazzini (4) divides the illness into three phases—prodromal, hyperkinetic and lethargic. He characterises the lethargic phase as a pseudo-stupor and not a true coma, as in this period there are frequently hallucinations of sight and hearing, without affect. Delirium is often present, and catatonia, flexibilitis cerea and catalepsy are the terms he uses to distinguish the motor anomalies (*v. inf.*) in the lethargic phase. Recovery from the latter is often slow, and symptoms remain that are slow in disappearing; these are adynamia and apathy, which may be sufficiently pronounced to be called "neurasthenia" or "melancholia." Mannerisms and inverted sleep rhythm are also sequelæ.

Kirby and Davis (1) usefully attempt to discriminate the principal mental reaction types occurring in the disease. They point out that

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in epidemic encephalitis we are dealing in all probability with a toxic-infectious agent, and they accordingly adopt Hoch's classification of mental reaction types.

" These are: (i) Organic reactions—characterised essentially by impairment of apprehension, interference with elaboration of impressions, defects in orientation and retention, difficulty in activisation of memories, with variability in mental capacity and level of attention —the so-called mental tension defect. It is now well established that this reaction is seen only when the brain has been damaged, temporarily or permanently, including injury by toxic-infectious agents.

" (ii) Affective reactions—characterised by emotional disturbance following essentially the pattern of the normal affective states. Typical examples are the manic-depressive oscillations and other benign emotional disorders.

" (iii) Trend reactions. These are characterised by abnormal trend and ideas, an unusual attitude towards the outside world, with constitutional peculiarities and psychogenic mechanisms in the foreground. Examples are schizophrenic and paranoid states.

" While these mental reaction types are often associated clinically in pure form, they need not coincide with what we call 'mental diseases.' In fact, one reaction does not exclude another. . . . It is our view that the psychiatric problem of epidemic encephalitis belongs essentially to the realm of the organic, more specifically the toxic-infectious mental types."

They add that the most frequent mental symptoms are drowsiness and delirium; that trend reactions are rare after the sensorium has cleared; but that, on the other hand, a peculiar affective state was liable to persist after the disappearance of all other mental symptoms.

Grossman (5), in a re-examination of 89 cases from six months to two years after the onset of illness, found irritability and depression to be the most frequent emotional disturbance; in a few cases a euphoric state was present; and a number showed compulsion or fear neuroses. Changes in disposition and disturbances in memory and reasoning were also remarked.

Method.—In each case a detailed mental and physical examination was made, with an anamnesis as complete as it was possible to obtain. The anamnesis is especially important for anomalous cases, and those occurring sporadically. Referring to pseudo-Parkinsonian cases, Bing (10) says, " Without an anamnesis the diagnosis would without doubt be Parkinson's disease."

Each case is taken up and commented on in detail. Thereafter the cases are considered in a group under the headings of " emotional reactions," " sleep," etc. A review is also made of the physical signs, the diagnosis and prognosis are considered, and lastly, the conclusions

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which are come to in regard to type of disorder, classification, prognosis, etc., are summarized.

General Symptomatology.

Emotional reactions.—From a review of the cases described it appears that while at least half of them showed an organic reaction (delirium) in the early stages, the most common psychic residuum is an emotional alteration. This seems at first to be in contrast to the findings of Kirby and Davis (1), who consider that "the psychiatric problem of epidemic encephalitis lies essentially in the realm of the organic reaction types." But the statement refers only to the earlier stages; and a survey of their 18 cases seems to show that only in 3 cases was an organic reaction present in the chronic stage; while the authors themselves remark, "the striking feature in all fifteen patients who did not recover was a change in the emotional reactions." This is in accord with the observations made in the present series.

In view of the grave physical disability existing in many of the patients, it is natural to ask whether the emotional change may not be more apparent than real; whether there is not a loss of showing affect, rather than an actual emotional deterioration. This was not borne out by the present inquiry; some of the ten patients confessed to a feeling of contentment, others to actual well-being, or even happiness, and in them all there was a strange lack of anxiety or worry as to the outcome of their illness, amounting, indeed, to a lack of insight.

The most common affective disorder is an apathy, varying in degree, with an accompanying depression in some cases, in others with a feeling of contentment or well-being. The following are the results of observations of the 10 cases in detail:

Apathy is present in 9 cases. In 4 of them it is combined with depression (Cases 2, 3, 4, 5). In 2 cases (1 and 7) it is accompanied by a feeling of well-being. In Case 9 the apathy is so profound as to amount to stupor, and in addition there are mutism, resistiveness, and irritability, but these do not amount to negativism. Kirby and Davis (1) point out that negativistic features are rare in encephalitis, and that the stupor of encephalitis has none of the characteristics of catatonic stupor. In the present case also these are absent—the resistance is not spring-like, there are no excited episodes, no fantastic postures, and no grimacing. Nevertheless, the term "catatonia" is frequently used in describing cases of epidemic encephalitis which show rigidity and flexibilitas cerea (*e.g.*, Mingazzini, quoted above). This is to be deprecated, and "catatonia" should be reserved for cases showing the definite psychotic symptom-complex well known to psychiatrists.

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In Case 7 a certain emotional facility suggests a degree of pseudo-bulbar involvement.

Case 6 is in striking contrast to the others; there was an exalted mood, with psychomotor excitement, lasting from the third to the eighth month of illness. The mood was in harmony with the delusional ideas.

Volitional disorder.—According to McDougall (6), the inter-relation of volition and emotion is very close, and essentially of a dynamic nature. He defines volition as "the supporting or reinforcing of a desire or emotion by the co-operation of an impulse excited within the system of the self-regarding sentiment." Now, "a sentiment is an organised system of emotional dispositions centred about the idea of some object" (McDougall, *loc. cit.*). Hence, if the emotions be perverted or their strength diminished, we should expect a corresponding perversion or diminution of volition. This is, in fact, what is found in cases of epidemic encephalitis. Mingazzini (*loc. cit.*) especially emphasizes the presence of what he calls "adynamia" in his cases. In the present series the volitional disorder is very evident. All but one (Case 6) of the patients display little or no spontaneous activity; they attend to the calls of nature, and do little else. They remain motionless for hours on end, reading nothing, doing nothing. They sit "gazing out of the window for hours." They have no spontaneous conversation. Subjectively, they "haven't the heart to do" their work, or their "ambition is all gone"; or they "don't care." Asked if they wish to return to work, some of them assent, but without any show of feeling, and with no more interest than an ordinary person would display in some abstract proposition in an unfamiliar science.

The impediment presented by the paresis must, of course, be allowed for, but the subjective phenomena seem sufficient to indicate a profound mental change in the volitional sphere, with which emotional deterioration is closely connected.

Flexibilitas cerea occurred in 2 cases, echolalia in 1, mutism and resistiveness in another.

Trend reactions.—Abnormal ideas are evident in only 2 cases (5 and 6). In Case 5 the ideas were not well defined; they seemed to depend on the depression. A kind of psychic hallucination also occurred: "I seemed to be back at work; something told me I wasn't doing it well."

In Case 6 a psychogenic mechanism is clearly present. The delirium had an obvious wish-basis. In addition, however, there were hallucinations, illusions, and psychomotor excitement, so that the term "psychogenic delirium" might be applied.

Delirium.—This is not a manifestation of the chronic stage of the

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disease, except in Case 3. In Case 6 a psychogenic type of delirium lasted over a period of months.

It seems worthy of note that in only 4 of the present series (2, 6, 8, 10) is there an undoubted history of early delirium. In Case 9 it is possible that the early symptoms were delirious in origin; and in Case 5 there was apparently a period of mental confusion. In the remaining 4 cases delirium was not present at onset. This is important for the diagnosis of the late manifestations, where considerable weight is placed on the history; many writers emphasize the frequency of delirium; thus Kirby and Davis found delirium in 15 out of 18 cases, and suspected it in the remaining 3.

Intellectual functions.—When the severity of the infection, as judged by the initial symptoms and by the lasting effects, both physical and mental, is considered, it might well be expected that a considerable defect would remain also in the field of intellect. This expectation is strengthened if the results of epidemic encephalitis be looked upon in the light of the toxic-infectious group in general; fluctuating defects of memory, retention, attention, and the more complicated functions, might well be expected—in brief, the chronic organic type of reaction (*cf.* D. K. Henderson (7) (2), by whom 2 cases are recorded of permanent memory defect following typhoid fever). A review of the case-material in the light of these considerations is interesting.

Thus, Case 1 shows a certain simplicity of mind, with defective memory for school knowledge, and impairment of the power of simple calculation. But these were probably pre-existent to a certain extent. There is no attention defect, and no fluctuation in mental tension. Case 2 shows no loss in the intellectual field.

In Case 3 orientation is imperfect, and there is a diffuse memory defect. There is also fluctuation of attention and difficulty in thinking. At nights there is occasionally actual delirium. Her age is 70, however, and these symptoms may be dependent on senile cerebral changes. There is no evidence of excessive arterio-sclerosis.

Retardation is the only obvious defect in Case 4.

Cases 5 and 6 show no remaining defect in this field. Case 6 was considered to be "simple" for a time after the subsidence of prolonged excitement.

Case 7 exhibits a slowing of mental reaction time.

In Case 8 there is no impairment.

Case 9 is mute, and consistently inattentive.

In Case 10 the simpler intellectual functions are intact, but an attempt to secure his co-operation in more complicated tests revealed a lack of attention.

Thus only in one case (3) was there a diffuse intellectual impair-

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ment, and in it there is the complicating senile factor. Case 1 and (for a time) Case 6 show a more limited defect. Cases 4 and 7 exhibit only some retardation, and in Case 10 there is only some fluctuation of attention, and no other obvious change. Cases 2, 4, 5, 8 and (ultimately) 6 are normal in the intellectual field.

The " organic " reaction-type is therefore conspicuously absent in the chronic stages of the malady.

Sleep.—Sleep disorder is a feature of most mental diseases, but it is usually to be regarded as incidental. In epidemic encephalitis, on the other hand, the sleep disorder is one of the outstanding symptoms, and its nature is frequently such as to be of diagnostic value. All varieties of sleep disturbance have been observed.

The most common abnormality is hypersomnia—the patient sleeps long at night, and is drowsy in the daytime. Kirby and Davis (1) recognize four gradations, *viz.*, drowsiness, lethargy, stupor, and coma.

Findlay and Shiskine (8) drew attention to the inverted sleep rhythm in a number of their cases. The patient cannot sleep at night, but in the early morning he falls asleep and remains asleep, often all day.

Climenko (9) describes insomnia (more accurately hyposomnia) as an early symptom, and Kirby and Davis describe it in 3 cases. It occurs also as a sequel to hypersomnia (Bremer (9), Kirby and Davis (1)), and is then frequently accompanied by over-activity. This occurred in Case 6 of the present series.

Case 1 sleeps well at night, drowsy by day—hypersomnia.
" 2 Ditto.
" 3 sleepless and restless at night (nocturnal delirium), sleeps by day (inverted rhythm).
" 4 hyposomnia throughout entire illness.
" 5 insomnia at onset, followed by hypersomnia.
" 6 hypersomnia, followed by hyposomnia, and then by a return to hypersomnia.
" 7 hypersomnia, followed by inverted sleep rhythm.
" 8 insomnia for two days at onset, then hypersomnia.
" 9 inversion at first, now normal.
" 10 insomnia for a day or two at onset, then hypersomnia, which has passed off.

These cases demonstrate very well the variety and striking nature of the sleep disturbance, and the tendency for more than one type to occur in the same case in succession.

Physical aspects.—Eight of the cases present a clinical picture which has been frequently referred to in recent literature, but not often described in detail. Bing (10) has published 2 cases; one of

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them, of three years' duration, was a typical paralysis agitans without indications of improvement. The second, at the end of a year from the onset, had salivation and some muscular weakness. He believes that the usual paralysis agitans and sporadic encephalitis are one and the same, and considers also that the post-encephalitic syndrome is not due to the virus, but that the initial lesion is so intense as to cause a disease picture which is progressive.

Barré and Reys (11) have described 4 cases, and they differentiate the following characteristic components of the variously-styled "Parkinsonism," "paralysis agitans sine agitatione," or "pseudo-Parkinsonian syndrome."

1. The absence of spontaneous movement.
2. Slowness of voluntary movement.
3. Muscular rigidity, generalised, but with its principal local manifestation (the most immediately striking feature of the syndrome) in the face, viz.—
4. The Parkinsonian mask.
5. Tremor.

All these are in evidence in each of 7 of our cases. To these 5 signs, Barré and Reys add oculomotor paralysis and disturbances of equilibrium; neither of which are at all constant in our series. It would seem justifiable to regard them as inessential to the typical clinical picture.

The remaining physical signs found in varying combinations in our cases may be tabulated thus:

	Cases.							
	1	2	3	4	7	8	9	10
Paresis (local)	×	—	×	—	×	×	×	×
Reflexes (unilateral exaggeration)	×	×	×	—	×	—	×	—
Reflexes (general exaggeration)	—	—	—	—	—	×	—	×
Dysphagia	—	×	—	×	×	×	—	—
Salivation	—	×	—	—	—	×	—	—
Speech defect	×	×	—	—	—	×	—	×
Nystagmus	×	—	—	—	×	—	—	×
Tremor	×	—	×	×	×	×	×	×

Cases 5 and 6 showed no physical signs in the chronic stage.

Facial paresis or paralysis was an early sign which tended to pass off completely. The limb palsies, on the other hand, were in some cases later of appearing, but were persistent. With them were associated increased tendon reflexes.

Dysphagia was a prominent feature in 4 cases, and was usually later in appearing.

The speech was usually slow and monotonous. In Case 8 the voice was reduced to a whisper.

Tremor was apparent only on voluntary movement in 5 cases.

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This sign would therefore be of some importance in distinguishing such cases from Parkinson's disease.

No unequivocal sensory disturbance was found in any case. In those cases where the cerebrospinal fluid was examined in the chronic stage no abnormality was found. A positive Wassermann occurred in a boy æt. 16.

Diagnosis.

The diagnosis is dealt with in certain cases in the "Comment," where a discussion seemed necessary. In this way Case 1 was discussed in relation to disseminated sclerosis, and Cases 3 and 10 in relation to arterio-sclerosis.

A history as detailed as possible is very desirable. Otherwise, if the mental symptoms predominate, such diagnoses as "depression," "melancholia" and "dementia præcox" are liable to be made (and were made in certain of the above cases that had been sent to mental hospitals); and if physical symptoms of a Parkinsonian type occur, the diagnosis is inevitably Parkinson's disease. (Bing (10)).

In cases where the diagnosis of manic-depressive insanity suggests itself, the history, the personality, the course of the disease (the absence of previous attacks, and the unvarying degree of depression), the type of volitional disorder, the absence, as a rule, of retardation, the concomitant physical symptoms, if any, and above all, the prominence of apathy rather than depression, should exclude such a diagnosis.

In excited cases the excitement may be indistinguishable from a true mania (Kirby and Davis (1)), but here the history and the characteristic sleep disturbance should prevent error.

Where the disease occurs later in life, and involution melancholia is considered, similar considerations arise, and the absence of delusions is important.

In contra-distinction to dementia præcox there is no "splitting"—the mood is in harmony with the thought content—and there are no bizarre ideas. True catatonic symptoms, as has been pointed out above, are absent.

Prognosis.

A detailed analysis of the duration and progress of the cases is of some interest in relation to the prognosis of epidemic encephalitis in general.

It is noteworthy that the presence of well-marked physical residuals influences the prognosis unfavourably, both from the mental and from the physical viewpoint. Of Kirby and Davis's (1) 10 cases with physical residuals only one could be said to have made a complete

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recovery mentally. Of Grossman's (5) series, 7 gave definite evidence of progressive deterioration. All of these 7 had well-marked physical residuals, 5 being of the Parkinsonian type. The remaining 82 were gradually improving. Grossman's figures relate only to the physical symptoms.

Of the 10 cases in this paper, one recovered after nine months, with some drowsiness for a few months longer. The remaining 9, of which 8 have well-marked physical residuals, show no tendency to improvement; on the contrary 8 of them exhibit progressive deterioration, either mental or physical, or both.

Case 1 is of comparatively short duration (four months); the condition, both mental and physical, seems stationary.

In Case 2 the physical symptoms were progressing when last seen (nineteen months after onset). The mental features appeared stationary.

In Case 3 mental and physical features have been increasing over a period of eight years. But advancing age is a complicating factor.

Case 4 was under observation from the ninth to the twelfth month of illness, and during that period seemed stationary in all respects.

Case 5, which has shown no physical symptoms while under observation, deteriorated slowly mentally for two years, but for the past year has shown no appreciable change.

Case 6 began to improve mentally six months from the onset, and recovered in nine months. All physical signs had disappeared in just over five months.

Case 7 eighteen months after onset was deteriorating physically and mentally.

Case 8 developed further physical symptoms fifteen months after the onset, and three months later the general physical condition was deteriorating. The progress of the mental condition was difficult to gauge on account of the lack of previous data.

Case 9 had improved so far at the end of eighteen months as to be able to look after her household duties. The improvement was maintained for five years, but at the end of that time she relapsed, and during the subsequent twenty-four years has gradually deteriorated physically and mentally. This case is therefore of unusual interest from the prognostic aspect.

Case 10 improved after five months, but has since become worse physically and mentally, and at the time of examination (eighteen months after onset) was a patient in a mental hospital. A tendency to extension of the disease, as well as to accentuation of the existing lesions, long after the acute stage has passed and the pyrexia subsided, is to be observed in Case 2 a year after onset (dysphagia); in Case 4, four months after (dysphagia and monoparesis); in Case 7, after

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five months (ocular palsies), and after fifteen months (dysphagia); and in Case 8 dysphagia set in fully a year after onset. Changes occurred in Case 10 between the time of discharge from hospital (five months after onset), and his admission to a mental hospital (two years from onset)—left facial paresis had gone, but general Parkinsonian symptoms had appeared.

Even where the disease appears to be stationary, therefore, it is not safe to disregard the possibility of actual extension of the disease till at least eighteen months after the initial infection. This seems to support Netter's (12) view that the virus may remain active for months, rather than Bing's opinion (*vide supra*) as to further changes being secondary to the initial lesion.

The prognosis of the 9 unrecovered cases is apparently bad on account of their chronicity and almost universal tendency to deterioration.

Summary and Conclusions.

Eight of the above 10 cases are sequelæ of epidemic encephalitis. The remaining two are of sporadic origin. They are admitted to the series on account of their probable similar ætiology, their long duration, and their importance from the diagnostic and prognostic point of view.

The striking mental residuum is an emotional disorder which is most commonly an apathy. The apathy is usually pronounced, and is in some cases accompanied by a mild degree of depression. A certain amount of euphoria may, on the other hand, be present, and in one case this amounted to definite exaltation, accompanied by psychomotor excitement.

The conclusion was come to that there is a real diminution in the field of emotional response, and not merely a diminished showing of affect. This is more emphatic than the conclusions of Kirby and Davis, who considered the disturbance to be chiefly a loss of showing affect.

Closely connected with the emotional alteration is a volitional disorder, consisting in 9 of the cases of adynamia. Flexibilitas cerea and echolalia are occasional symptoms. Mutism and rigidity occurred in one case. The rigidity so frequently observed is of physical origin.

The use of the term "catatonia" with reference to the volitional disorder is deprecated.

Trend reactions are rare in these chronic cases. Where delirium occurs apart from the onset, it is probably due to a complication.

There is occasionally a slight, patchy, intellectual defect in uncomplicated cases, but, as a rule, the chronic organic type of reaction is absent.

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Sleep disturbance is a characteristic sequel of the disease. Its nature varies in different cases and at different times in the same case. Hyposomnia, hypersomnia and inverted rhythm are all met with.

A Parkinsonian syndrome is a frequent physical residuum. Its presence appears to influence the entire prognosis unfavourably.

In dealing with the question of diagnosis, it may be pointed out that sporadic cases of the disease do occur (Bing (10), Kraus (9), and Pardee (15)) and that they, like Cases 3 and 9 above, may occasion great difficulty in diagnosis. Even these cases which originate in a recognized epidemic may later be diagnosed as manic-depressive insanity, dementia præcox, and so on. The points of difference are discussed, and emphasis laid on the importance of the history, and of a complete neurological examination. Where the mental symptoms are outstanding the physical residuals are apt to be overlooked, and *vice versâ*, so that a diagnosis of " Parkinson's disease " may be made.

The prognosis of chronic cases is poor, especially these with pronounced physical signs. Mental and physical deterioration are apt to increase with time. Extension of the disease may occur up to fifteen months from onset.

Cases.[3]

[3] For reasons of space, only Cases 3, 5 and 8 are published in full.

Case 1: *Comment.*—The disease occurs in a young person in association with an epidemic of encephalitis.

This case exhibits the following physical features: generalized muscular rigidity, with mask-like facies and a " wooden " attitude; infrequency and slowness of spontaneous movement; slow, monotonous speech; nystagmus, and weakness of convergence, with pallor of the temporal halves of the optic discs; hemiparesis, with increase of reflexes, and in the upper arm, intention tremor and adiadokokinesis.

There are thus two groups of symptoms—a Parkinsonian group, and a syndrome suggestive of disseminated sclerosis. The former, however, is the much more prominent.

Cases combining the symptoms of paralysis agitans and disseminated sclerosis have been recorded (Oppenheim).

The age of the patient, the nystagmus, the intention tremor, the pallor of the temporal halves of the discs, the hemiparesis and the history of diplopia are in favour of the diagnosis of disseminated sclerosis. On the other hand, the abdominal reflexes are present and equal on the two sides, there is no spasticity and no Babinski, and there is no contraction of the visual fields.

Moreover, the fact that any or all of these signs, with the possible

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exception of the pallor of the disc, may occur in epidemic encephalitis; the occurrence of the case in association with an outbreak of the latter disease, and above all, the Parkinsonian signs, make the diagnosis of encephalitis the more probable of the two.

The principal psychic feature is the emotional attitude. The mood is optimistic in the highest degree. She is perfectly certain that she will recover. There is no trace of anxiety on this point. Her behaviour corresponds with her mood. She is quiet, smiles happily when spoken to, and is obviously contented. Adynamia is also present. There is a patchy intellectual defect; this may in part be due to a pre-existing mental defect, as suggested by the simplicity of her manner, the echolalia, and the gaps in her school and general knowledge; but that some of it at least is acquired is supported by her statement that she has found greater difficulty in doing simple calculations since the onset of her illness.

While, therefore, the affective reaction with volitional loss is the prominent feature, there are traces of an organic reaction also.

CASE 2: *Comment.*—The most striking psychical signs at the present moment are apathy (despite his serious physical condition), lethargy, and retardation, combined with apparently unimpaired intellectual faculties in memory, judgment, ability to calculate, apperception, etc. These occurring in a man æt. 41, after a period of confusion, with associated local palsy, and at a time when epidemic encephalitis is prevalent, are practically diagnostic of the disease.

It is noteworthy that the so-called organic reaction, notwithstanding the admittedly toxic cause and the persistent physical disorders, is conspicuously absent.

That the lethargy and retardation were not observed for twelve months after the onset, and that they have been gradually increasing, is of importance in the prognosis of early cases of this disease. It is surely also remarkable that while the original facial paralysis has completely cleared up, muscular rigidity, most marked in the face, but occurring also in the body and limbs, should develop and become progressively worse, and that dysphagia and salivation should appear twelve months after the original infection. These facts support Netter's (12) view (*vide infra*).

The mask-like face, the immobility of the body, the characteristic attitude, the salivation, and the slowness of speech and voluntary movement, constitute the chief physical features, and give to the clinical picture a clear resemblance to Parkinson's disease; and it seems justifiable to regard this as the sequela of an attack of epidemic encephalitis.

The failure of protein-shock treatment seems rather to support

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Bing's (10) contention (as opposed to Netter's) that these signs are dependent on a degenerative process, the original infection having died out.

CASE 3.—Female, æt. 70; occupation, at home; admitted June 1, 1921, as a voluntary patient to the Royal Asylum, Gartnavel.

Family history.—The father was twice married. By the first marriage there were four children, all girls. The eldest of these died young from a cause unknown to informant; the second died after marriage (childbirth ?); the third sister is at present a patient in the same institution as the patient, who is the youngest.

By the second marriage there were three children, two boys and one girl, of whom one committed suicide.

Personal history.—At school she made fair progress (taking no prizes), and left it about 14 years of age. She liked company and had chums, both boys and girls. Her parents wished her to be a teacher, and she was at the Normal School for a year, but she had a hæmatemesis and ceased attending classes. She kept house thereafter for a brother, and lived with him after his marriage, becoming much attached to his son (whose death in the war, after the onset of her illness, distressed her greatly). She is described as, at that time, a good houseworker, clever at sewing, not musical and not much given to reading, and a church-goer, but not morbidly religious. She tended always to look on the gloomy side of things, but was active and capable till 1913, when her illness began.

On coming out of church one Sunday in 1913 she said to a friend, "I can't walk." She managed, however, to walk home, leaning on her friend's arm. She has ever since complained of loss of power in her limbs, especially on the right side. The weakness has gradually increased, and she has ceased to exert herself, or to take an interest in anything. She has had a feeling of malaise, has been depressed, and has felt unequal to her ordinary tasks. She was willing to work, she said, but could not. She did a little sewing occasionally until a year ago, but since then she has ceased even to attend to herself, having to be washed and dressed. Otherwise her habits are clean. At one period of her illness she is stated to have had diplopia, but the date of this is not remembered.

Condition on admission.—She felt depressed and weak. "Everything feels heavy." "My bones are all tired, and my legs and knees; my right side is the worst."

Her remote memory was only moderately good, being defective for names and dates more than for events. Her recent memory was fairly good. Orientation for place was correct, but for time it was imperfect—she gave the day and month correctly, but the year as 1922 (1921). Her grasp of school and general knowledge was very poor. Retention was defective. She failed to do simple calculations, saying, "I never was good at arithmetic."

Present condition.—Her mental condition remains very similar to what it was on admission. Her feeling of depression, for which she can give no reason, and her disinclination for even the lightest task, continue. There is no play of emotion; nothing stirs her depressed state. Her memory, orientation and retention defects are more obvious than before. Apprehension tests reveal no marked defect, but her power of apperception is much diminished; she reads the cowboy story with a few mistakes, which she spontaneously corrected, but was unable to give any account of it in her own words.

Attention fluctuates. She feels a difficulty in thinking. There is also a considerable fluctuation in her mental condition as a whole, which at times becomes one of confusion, and, more rarely, of delirium; she is then almost completely disoriented, saying that "the house is being robbed," that "the people opposite" (the other patients) "are going to do something" to her, or that she must "get up for the train is starting."

She is drowsy in the daytime and sleeps a good deal, but at night she is sleepless and restless, getting out of bed.

Physical condition.—She is very thin and old looking. There is a well-marked arcus senilis. The upper eyelids are slightly ptosed, the features immobile, and the whole expression mask-like. Her attitude never changes. The head is held stiffly and slightly bent, with the eyes looking always straight forward. She sits rigidly upright, rarely turning her head or moving a muscle. The limbs also are

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rigid, and her fingers maintain one position, being semiflexed at the metacarpo-phalangeal joints, and having the thumb in apposition as if about to initiate the pill-rolling tremor of paralysis agitans. She remains always in the attitude described, except when compelled to rise and walk, which she does very slowly, with the whole body, except the lower limbs, in the same rigid position as before.

Her speech is slow and monotonous, with an initial pause. There is no enunciatory defect, but her remarks trail off into silence, as if from lack of energy.

She is slow at eating and swallowing, but has not actual difficulty. All voluntary movements are slowed, and the extent of the retardation may be gauged from the fact that she succeeded in making with her right hand only five dots with a pencil on paper in ten seconds.

There is a generalised muscular weakness, greatest in the muscles of the face on the right side, the left side of the tongue, and the right arm. The right nasolabial fold is not so well defined as the left; when she shows her teeth, the upper lip is not raised so far on the right side, and is tremulous, and the tongue on protrusion deviates to the left. The right hand-grip is only a little stronger than the left. The strength of the grip in both hands is very slow in attaining its maximum.

The tongue is tremulous, and there is a coarse irregular tremor of the right upper limb on movement, amounting to actual jerking when finer movements are attempted. Her handwriting is so tremulous as to be practically illegible.

There is generalised myotatic irritability.

Reflexes.—All the ocular reflexes are present and active. Right biceps, triceps and supinator jerks are more active than those of the left arm. The epigastric and abdominal reflexes are active on the right side and absent on the left. Knee-jerks and ankle-jerks are active and equal. The plantar response is flexor on both sides. There is no ankle or patellar clonus.

Sensation.—There are no pains or paræsthesiæ. The sensibility to light touch is diminished in both upper and lower limbs, and localisation is often erratic. With painful stimulation similar results are obtained. Tests for the sensation of heat and cold reveal, especially in the fingers of the right hand, a lack of appreciation of the quality of a single stimulus, but when the contrast stimulus is applied to the same spot the difference is noticed. All the above results apply especially to the extremities—the hands and feet—which suggests that they may be dependent on a circulatory defect rather than on a lesion of the sensory apparatus.

The sense of position of the limbs is normal, and there is no astereognosis.

Special senses.—Smell: She is aware of common odours, but cannot name them, or select any of them from a series suggested to her. Taste: She recognises sugar, salt, and quinine. Hearing: She hears well with both ears. Vision: There is no irregularity or inequality of pupils. There is at present no diplopia and no strabismus. Convergence is weak. Otherwise the ocular movements are normal. She can read ordinary print without artificial aid. Colour vision and the visual fields are normal. The fundi are pale. The disc margins are well defined.

Comment.—Differential diagnosis: The case differs from the great majority of cases designated paralysis agitans in (i) the suddenness of onset, (ii) the general muscular weakness existing from the beginning, (iii) the history of diplopia, (iv) the localized paresis, involving the right arm, (v) the absence of tremor while at rest, and its presence in the right arm on voluntary movement, especially when fully co-ordinated movement is required (intention tremor), (vi) the definite depression synchronising with the onset of the physical symptoms, and continuing.

On the other hand there is an absence of a history of characteristic initial symptoms—lethargy, delirium, etc.—but this does not exclude an encephalitic origin (see Cases 1 and 2) (Walshe (14)). There is also the very definite existence of arterio-sclerosis, which certainly com-

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plicates the psychotic picture, and might be considered to be the cause of the condition. There are, however, none of the "cerebral complexes"—disorder of speech, vision, etc.—or apoplectiform or epileptiform attacks, and the psychical symptoms of such a state—emotionalism, irritability, and characteristic memory loss are wanting. Moreover, the physical signs of arterio-sclerosis are not outstanding, the only one that is present is the thickening of the radials. The blood-pressure is low, and the heart is not enlarged. There is no albumen in the urine.

Oppenheim remarks (*Text-book of Nervous Diseases*, p. 307): "It is difficult to say whether arterio-sclerotic forms can be sharply distinguished from paralysis agitans, or whether the pathological processes are identical, the difference being one of intensity or localization."

To sum up: The attitude, the monotonous speech, the absence of spontaneous movement, the slowness of voluntary movement and the muscular rigidity of this patient make the case conform closely to the type described by Barré and Reys as occurring as a sequel to epidemic encephalitis, while other facts suggest a vascular origin. The weight of the evidence is in favour of the former.

From the psychiatric aspect the symptoms fall under several headings:

1. The emotional condition in one of depression and apathy, which are continuous except for—

2. Delirious episodes, when a certain fear is evident But the fear reaches but a low degree of intensity. Under this head come also the memory, orientation, retention, mental tension, and apperception defects—evidences of an organic type of reaction.

3. Volitional slumping has been prominent almost from the beginning. There has been gradually increasing disinclination for the slightest task; and now she almost entirely lacks initiative. This condition is probably largely but not entirely dependent on her physical condition—weakness, malaise, etc.

4. The sleep rhythm is inverted. Night restlessness is common to epidemic encephalitis and arterio-sclerotic brain disease, and delirium or mental confusion at night is more characteristic of the latter than of the former.

The special interest of this case lies in the fact that it presents a picture closely resembling the chronic stages of epidemic encephalitis, that it occurred sporadically, that it presents atypical Parkinsonian features, and finally, on account of the accompanying long-lasting psychoses, has come to reside in a mental hospital.

CASE 4: *Comment.*—The occurrence of the case at a time when epidemic encephalitis is prevalent.

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The striking group of physical signs: generalized rigidity, with its most obvious local manifestation in the mask-like countenance; infrequency of spontaneous movements; slowness of movement when it does occur (motor retardation), accounting, at least in part, for the dysphagia; slow and monotonous speech; tremor on *voluntary* movement.

These together constitute a syndrome closely resembling Parkinson's disease, but with obvious differences (*e.g.*, tremor on voluntary movement, and occurring in a man æt. 40).

The psychic symptoms: the initial psycho-motor excitement followed by apathy and depression with retardation, and adynamia with flexibilitas cerea, but with an entire absence of the so-called "organic reaction."

The sleep disturbance—persistent hyposomnia.

The lack of response to varied therapeutic measures, especially to "protein-shock" treatment (*vide* also Case 2).

CASE 5.—Male, æt. 45; admitted as a voluntary patient November 13, 1920; occupation, pattern-maker.

Family history.—The only fact of importance is that his mother was mentally afflicted, and in an asylum for three months.

Personal history.—He is said to have been always a strong, healthy man, good at his work, and steady in his habits. He married in 1901, and in 1902 went to South Africa, where he had a post as pattern-maker under the Union Government. His married life is described as happy. He did not, however, show as much affection towards his wife as he might have done. There have been no children. He masturbated even after his marriage, and this worried him a good deal.

About three years ago he began to have a feeling of general weakness, with pain across the shoulders. The doctor whom he consulted diagnosed rheumatism, and prescribed a belladonna plaster, which relieved him and enabled him to continue at his work. In November, 1918, he had a definite "breakdown"; he was excited, irritable, and emotional, weeping without apparent reason; he was depressed, often saying that there was nothing to live for; and he complained of dizziness and headache. His doctor recommended bed and a change of air, and the patient went up-country for two months; but little benefit ensued. He came to England subsequently, and went back to South Africa in January, 1920, where, however, he did not try to apply himself to work, displaying a great lack of interest and energy. In May, 1920, he again returned to this country, and took up work here, but left it in three weeks' time.

He has gradually become more and more unsociable and taciturn, and from time to time has shown ill-feeling towards his wife, having actually struck her on one occasion. There have been occasions when he seemed to hear voices, and to reply to them in obscene language. More than once he has wandered away from home, and on his return has failed to give a definite account of his movements. Since the beginning of his illness he has had no marital relations with his wife.

Sleeplessness troubled him in the early stages. Latterly he has been drowsy.

Condition on admission.—He was dull and depressed, but showed little retardation, answering questions fairly promptly and to the point. He did not give a spontaneous account of his illness, and had to be questioned closely. A feeling of depression was admitted, and he stated that he could not concentrate on his work or anything else, and that in consequence life seemed not worth living. The depression seemed to him to arise from a feeling that he had done wrong; he blamed himself for having done small pieces of work for his friends when he should have been doing Government work, and for sexual faults which had continued after marriage. The emotionalism mentioned above he believed to be due to his general depression, and his feeling of incapacity for work. Asked for an

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explanation of his use of obscene language, he denied hearing voices, but said that he had had at times a kind of day-dream, a feeling that he was back at work, that something told him he was not doing his job well, and that in response to this feeling he used bad language.

Orientation, memory and grasp of general intelligence were unimpaired. He performed simple calculations slowly, but correctly. He realised that he was not well and in need of treatment. Blood for Wassermann reaction negative.

Progress of the case.—November 20, 1920: He is a little brighter, and is walking in the grounds with other patients and an attendant.

February 24, 1921: There is little change. He is lethargic and apathetic. Takes no interest in anything except whist, and can only be persuaded with difficulty to go for a walk.

June 29, 1921: No change. He exhibits a vast inertia. He reads the papers, and speaks politely when spoken to, but his general bearing is lazy and indifferent. Only once has he shown any emotional reaction; when he was taken before the class for demonstration he was angry and refused to go; when he did go, he was sullen and unresponsive.

Present condition.—He sits in the day-room most of the day, taking little interest in anything beyond an occasional game of cards and billiards. He is quiet and even morose, and does not speak unless spoken to. His immobility is a salient feature. His expression is one of dull indifference; on rare occasions he is known to smile, but his smile is always sardonic. When questioned he answers in an uninterested sort of way, in a low voice, and as briefly as possible; some questions he does not answer at all, even when they are repeated. Emotionally he displays little elasticity. He is always more or less sullen. His depression, he feels, has not lifted in the slightest. He cannot concentrate, and his ambition is all gone. He "doesn't care" that he is ill, and does not believe that he will ever be any better, nor does he think it matters. Neither trying allusions nor jokes produce apparent response.

There is no gross intellectual disorder. Orientation is correct. Memory, recent and remote, is accurate. There is no retention defect. The grasp of school knowledge is good, and general knowledge is limited but accurate. Simple calculations are performed accurately and fairly smartly. Reading and writing show no defect. Apprehension and apperception are normal. His attention has to be closely held, for he tends always to retire into himself. Mental reaction time: He took half as long again to deal 50 cards in one heap as a normal person. When discrimination was required (dealing the cards into heaps according to their face-number) he took nearly three times as long as the normal person.

Physical condition.—He is a well-developed man of more than medium height. The distribution of hair, however, is of the feminine type—he is comparatively hairless, the hair on the face being scanty, and practically wanting on the cheeks, while the upper level of the pubic hair is horizontal.

The face is pale, but the mucous membranes are well coloured. The tongue is clean. Heart and lungs are normal.

Sensation.—There are no pains or paræsthesiæ.

Special senses.—Smell: Odours were perceived in the left nostril to the extent of 50 *per cent.* correct recognitions; in the right none were correctly recognised. Taste is apparently normal. Vision: He can read ordinary print with both eyes. Ocular movements are normal. The visual fields are normal. The pupils are regular. The left is the larger. The fundi are normal. The discs show a physiological cup fairly well marked.

Reflexes.—Pupillary reflexes are active. The tendon jerks are brisk in the arms. The knee-jerks are rather sluggish. The Achilles-jerks are active. The abdominal and epigastric reflexes are more active on the left side. The plantar response is flexor on both sides.

Motor functions.—There is no pathological difference in the muscular force of the two sides. There is lack of energy in the hand-grip, but no slowness in coming into action. There is no tremor.

Cerebro-spinal fluid.—Cell count, 1·56 per c.mm. Centrifugalised deposit on slide gives 21 cells per 200 oil immersion fields (all lymphocytes). Globulin (Ross-Jones method)—extremely faint ring after three minutes. Wassermann negative. Colloidal gold 0011000000.

The pain across the shoulders, which was the first symptom, is suggestive of a radicular involvement (Walshe (14)).

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Comment.—The suddenness of the onset, its occurrence during an epidemic of encephalitis, the mental excitement and the dizziness and headache, make the diagnosis of epidemic encephalitis probable.

The emotional disturbance has been the prominent one from the beginning, but in addition there is a slightly delusional trend. Yet notwithstanding the persistence of these reactions, indicating a profound mental change, and in spite of the very probable toxic origin of the disease, there is a complete absence of the so-called organic reaction supposed to be the characteristic result of toxins and infections. (There may have been, but only at the beginning, some mental confusion, as evidenced by his wandering away from home.)

The chief symptoms of the emotional derangement are apathy, with complete indifference to his surroundings and the ultimate course of the disease, diminution of the field of emotional response, moroseness, irritability, and alienation from his wife.

There is also lack of ambition, and even a diminution of ordinary spontaneity.

It is also worth noting that the psychosis has occurred in a man with an abnormal distribution of hair, and with an abnormal sexual life.

CASE 6: *Comment.*—The prodromal period of drowsiness.

The acute onset, with pyrexia (rather high—104°), rigor, headache, delirium, ptosis and evanescent facial palsy—a collection of symptoms very suggestive of epidemic encephalitis.

The somnolence for the first five months, replaced by hyposomnia for about six weeks, and recurring after that over a period of months, finally to pass off.

The sequence of psychical phenomena: delirium; stupor; exaltation and psychomotor excitement with illusions merging into a very definite trend reaction, hallucinations and delusions, and then during convalescence a return to mild exaltation, and finally to the normal, but with a lethargy persisting for some time.

The striking wish-basis in the delusion.

CASE 7: *Comment.*—Abrupt onset of lethargy, without pyrexia or delirium.

Within four months (at latest) ocular palsies, and commencing mask-like facies.

Positive Wassermann reaction in cerebro-spinal fluid.

About twelve months after the onset dysphagia appeared. About the same time, too, hypersomnia, which had diminished, gave place to inverted sleep rhythm. The changes in the clinical picture, of which the above are examples, are interesting. Thus the right pupil

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is now smaller than the left, instead of the reverse, as at first; an early abducens weakness has passed off, and a convergence weakness is now present. Nystagmus has increased. The early unilateral facial paresis has passed off; the speech, at first merely feeble, is now feeble, slow, monotonous, scanning and slurring; coarse tremor apart from movement has latterly appeared in the right forearm; the knee-jerks have varied.

Mentally he was contented, even happy; he tended to be apathetic towards his surroundings, and with regard to his future he was complacent; the only intellectual change was a slight retention defect, and some slowing of mental reaction times.

CASE 8.—Female, æt. 24; occupation, secretary.

Family history.—Her father had a hemiplegia with aphasia in 1919, but he recovered sufficiently to return to work. A brother has recently developed obscure nervous symptoms following on a period of ill-health ensuing on Army service.

Personal history.—She was first seen by Prof. Monro on Wednesday, April 21, 1920. (We quote from his "Clinical Lecture on Lethargic Encephalitis"). She had had "headache for several weeks. Stopped work on April 15. Headache had been violent for two or three days before she stopped. Double vision from Friday till yesterday. Diplopia to-day on looking strongly to either side. No vomiting. Bowels moved freely (after medicine) into the bed in sleep. Slightly drowsy yesterday; very drowsy to-day. Says she is 'awfully sleepy,' but she can easily be roused. At times has talked nonsense, but at visit is quite intelligent, although voice rather feeble. From Friday till Sunday there was swelling in right orbital region. Giddiness in trying to rise. Slight fever. Pulse 118. Bilateral ptosis with overaction of frontals. Tongue slightly dry. Power of showing teeth feeble. No certain palsy except in ocular regions. Abdominal reflexes active. No recognisable optic neuritis. Chest and abdomen normal."

In addition, she was "run down" before the onset of the illness; at the beginning she had no sleep for two nights (before the onset of lethargy); she seemed excited and talked very fast, her face was much flushed, a *tâche cérébrale* could be readily elicited, and meningismus was present.

She entered hospital, and was detained for three months, during which time the lethargy continued. At the end of two months she was tried up, and it was observed that she had difficulty in walking, due to right-sided paresis. Drugs and electrical treatment were of no avail.

In July, 1921 (fifteen months from onset), she began to complain of difficulty in swallowing, especially solid food—it "seems to stick."

Salivation has been continuously troublesome. She has become very slow in her movements.

Before her illness she was bright, sociable, and energetic. She was clever at school, and took prizes. At business she was capable, and occupied a responsible position. She is left-handed.

Present condition.—She is pale. She lies motionless in bed in the recumbent position for hours on end. The face is expressionless. The eyes are widely open and seem to stare, remaining motionless for long periods. The voice does not rise above a whisper, and her answers are usually monosyllabic. She displays a lack of appreciation of the seriousness of her illness. She feels fairly happy. Before her illness she was inclined to be emotional, but now she is not moved either to laughter or tears. In short, the emotional abnormality is a striking mental feature.

Her memory, recent and remote, is accurate. Orientation is correct, and simple calculation is smartly performed. Her attention during examination is well sustained.

Physical condition.—The right pupil is larger than the left. Both are slightly irregular and eccentric. They react actively to light, but accommodation is sluggish. There is strabismus, the right eye looking slightly outwards. Convergence

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fails to occur in the right eye, but conjugate movements are not interfered with. The visual fields are normal. Photophobia and lacrymation have been present at times. The acuity of hearing (watch test) is diminished on both sides. Air-conduction in each case is better than bone-conduction. Odours are perceived, but not discriminated. There is a generalised paresis, with rigidity, especially affecting the right arm and leg. The tendon-jerks are all exaggerated, especially on the right side.

Babinski's sign is present on the right. A slight degree of ankle-clonus can be elicited on the right side. Some degree of contracture has occurred in the right hamstrings, and there is a beginning right pes equinus.

There is some tremor of the tongue.

There is a coarse tremor of the right upper limb on movement. All movements are performed with extreme slowness. No disturbance of general cutaneous sensation is apparent.

Comment.—The onset, with fever, headache, drowsiness, ptosis and diplopia, is practically diagnostic of epidemic encephalitis.

The early excitement and insomnia is in contrast with the subsequent condition—hypersomnia.

The early palsies have largely disappeared, and been replaced by dysphagia (fifteen months after the onset) and generalized palsies of the limbs. This is important for the prognosis of similar cases.

The mask-like countenance, and the general immobility and rigidity and slowness of movement, make this case worthy of inclusion in a pseudo-Parkinsonian group. In addition, bulbar symptoms (dysphagia and dysarthria) are prominent.

The mental change is chiefly in the emotional sphere and is distinctive.

There is an emotional blunting, amounting to apathy, but combined with this is a feeling almost of well-being and of optimism regarding her future. This last seems to indicate a deterioration in the intellectual sphere as well—a lack of judgment. No other intellectual defect was elicited.

Case 9: *Comment.*—This patient first became ill at the age of 34—thirty years ago—with great motor excitement, incoherence of speech, sleeplessness, and (after a few weeks) resistiveness. The description is too meagre for differential diagnosis, but the condition may have been one either of delirium or maniacal excitement. The stage of excitement lasted about four weeks, at the end of which time the description suggests a delirium, chiefly nocturnal. The "noises in the head" were apparently not hallucinations; they may have resulted from irritation of the eighth nerve.

Three months from the onset she had passed into a stuporose condition, which lasted for nearly six months. This gave way to an apathetic depression (of which the apathy was the more prominent feature apparently), with psychomotor retardation and lack of initiative. There was no trend, and no disorder of thought. This condition persisted for at least a year; she then improved con-

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siderably for five years, but at the end of that time relapsed into her former apathetic adynamic condition, which has gradually increased until finally she has returned to a stuporose condition, in which—thirty years after the onset—she remains mute, apathetic, adynamic, resistive. Moreover there is present a Parkinsonian syndrome.

Differential diagnosis.—There is, of course, no history of initial pyrexia, and at this distance in time it is not possible to obtain details. But such a history is often absent even in authenticated cases of epidemic encephalitis.

The clinical records are too scanty for certainty regarding the type of excitement, but there is nothing to indicate that it was not a delirium. If the excitement were to be regarded as manic-depressive in type, numerous difficulties would be met with: there was no previous attack, and no recurrence; the subsequent stage was characterised by apathy more than by depression, by absence of volition rather than impediment thereof. There was a recovery—apparently only partial—for a period of five years, followed by an apathetic and latterly stuporose condition which has lasted twenty-four years. The whole course is, in fact, remarkable, and foreign to the picture of manic-depressive insanity.

She has displayed none of the symptoms characteristic of catatonic conditions—she has been resistive, but not negativistic; she has never been impulsive or grimacing.

The Parkinsonian signs are now very obvious; they raise the question of arterio-sclerosis. The radial vessels are not unduly thickened for her years, and the heart is not enlarged. The urine is normal; the blood-pressure is 170 mm. Hg. There are none of the cerebral complexes present (*vide* Case 3).

Finally, the resemblance this case bears to authentic cases of epidemic encephalitis is very close, and the presumption on a review of the evidence that it is a sporadic case of the disease seems justified.

The case is specially interesting because of its atypical course (as above described), its long duration, the accompanying Parkinsonian syndrome, and its marked resemblance to certain residuals of epidemic encephalitis, and consequently its bearing on the prognosis of chronic cases of the latter.

Case 10: *Comment.*—This case occurred in a young, nervous adult during an epidemic of encephalitis.

There was a preliminary stage of excitement, with sleeplessness, cranial nerve signs (irritation of seventh, paralysis of third), and pyrexia.

On the third day myoclonus appeared. There were pyrexia and delirium. These were followed by drowsiness (lethargy), from which

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he could be aroused, when he talked rationally. The early palsies were evanescent, and the reflexes were changeable.

Improvement in the mental condition occurred on the eighth day, and persisted.

There was a slight relapse five weeks after the onset. The condition of the throat, the laryngitis and the otorrhœa are noteworthy. The presence of the latter suggests the possibility of meningitis or cerebral abscess. But there were no headache or vomiting, and no slowing of the pulse or subnormal temperature at any time.

He recovered up to a point, but paresis of the left side has persisted, and the clinical picture has changed. There is general immobility; the face is expressionless, the eyes are more or less fixed, and the limbs and trunk are seldom moved except on command. His movements are slow. Intention tremor is present in the left arm. There is a certain degree of flexibilitas cerea. In brief, the pseudo-Parkinsonian syndrome is fairly well marked. On the mental side the early excitement was followed by delirium and then by lethargy. The drowsiness has passed off, but a total lack of interest has followed, with almost complete loss of emotional reaction and of volition, but with clear intelligence and apparent insight.

The apathy and the absence of spontaneous movement, depending on apparent lack of volition, give this case a superficial resemblance to dementia præcox. But the intelligence is unimpaired, there is no "splitting" of consciousness, there are no bizarre ideas, and he realises that he is ill. There is no negativism, stereotypy, impulsiveness or grimacing. Moreover, such a diagnosis takes no account of the numerous and well-marked physical signs, and the very definite history of the illness. Finally, the resemblance of this case to several of those recorded above is too close to be ignored.

The case is specially interesting because, months after the onset, the patient has been placed in an asylum, and because of its superficial resemblance to, and diagnosis as, a dementia-præcox type of reaction.

[I desire to acknowledge my indebtedness for permission to record cases and for their encouragement and advice to Prof. Stockman, Prof. Monro, Dr. G. H. Clark, Dr. Walker (of Paisley), Dr. A. G. W. Thomson, Dr. Whitelaw, Dr. Carre, and especially Dr. D. K. Henderson, Physician-Superintendent of the Glasgow Royal Hospital.]

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(3) It is interesting to note, in relation to the emotional disorder in the present series, that one of these cases was apathetic, the other excitable and suspicious.

The Diagnosis of Dysenteric Infections in Mental Hospitals.

By A. A. W. Petrie, M.D., M.R.C.P.Lond., Deputy Medical Superintendent, The Maudsley Hospital, Denmark Hill, London.

The diagnosis of dysentery is a matter of considerable administrative importance in mental hospitals.

In its acute form the diagnosis is comparatively easy, either clinically or by pathological methods, but the real problem is the recognition of very mild forms and of chronic and latent cases. These latter cause trouble by providing the foci of infection which lead to recurrent attacks of the acute disease. In such cases the laboratory may be most useful, but here the matter may be more difficult, and there are distinct limitations.

Non-Dysenteric Diarrhœas.

Before discussing the true dysenteries I will first consider briefly some of the *non-dysenteric diarrhœas* which may occur. Acute diarrhœa may occur during the course of Graves' or Addison's disease, and as an initial symptom of appendicitis, but these should cause little trouble in diagnosis. Some of the causes of acute gastro-intestinal irritation may present more difficulty.

Undetected poisoning from *drugs* causing intestinal irritation are, owing to their limited opportunities, rarely seen among the insane. I have observed a troublesome diarrhœa in chronic excited cases who have taken considerable quantities of sedative drugs, particularly sulphonal. This is possibly due to irritation set up by a retention within the gut of a considerable quantity of this insoluble drug.

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