for a shorter or longer period, or it may be evidenced by exacerbation of the reaction each time grease is applied. This feature may seriously retard treatment, because even when the affected area appears to cry out for grease as a result of treatment with astringent lotions, etc., its application may be followed by disastrous results. A satisfactory routine treatment for the average case is to use boric starch poultices every three hours until exudation has ceased. Starch jelly is best applied to a body fold enclosed in a single layer of gauze instead of spreading it on a backing of linen. Irritation of the skin by hard edges of linen is thus easily avoided. When the lesions are dry one of the aniline dyes may be used as a varnish to reduce the infection. Probably the best of the dyes is gentian-violet, used as a 2 per cent. aqueous solution. Alcoholic solutions are not well tolerated, and for this reason certain of the anilines are not suitable. The application is made once daily for two consecutive days, and on the third day an ichthyol paste is used morning and night. The paste is removed before each fresh application by olive oil and then soap and water. If grease is not tolerated, starch poultices can be used every third day in place of the paste. The object of intermitting the aniline treatment is to obviate caking from repeated varnishing and the fissuring which would result from this. When the reaction has paled considerably with this treatment crude gas-works tar should be used. This is varnished on and talc powder applied immediately to accelerate the drying of the tar. The tar is allowed to wear off gradually with ordinary daily washing with soap and water and is renewed every few days. No attempt should be made to forcibly remove it regularly with olive oil. Lastly, one or two small doses of x rays may be necessary to clear the final dregs of the inflammatory reaction.

As alternatives, astringent aqueous lotions of 2 per cent. tannic acid, 1/2 per cent. silver nitrate, or 5 per cent. liq. plumb. subacet. fort. in calamine lotion may be applied every three hours as wet dressings. It may be necessary to try several of these in rotation, including starch, in very irritable and unresponsive cases. The areas should be watched carefully, and at the least sign of a commencing flare-up a change should be made in the type of dressing.

Generalized cases are treated in a similar manner, and it may be noted that the anilines, and also tar, may be safely applied to large areas of skin. Internal remedies are of little value, although in long-standing cases and generalized cases iron and arsenic may help. The diet is of some importance, and should be low in carbohydrate and have a high vitamin content, either included in natural foodstuff or added as concentrated preparations. The main consideration in effecting a cure is carefully chosen, carefully applied, and carefully watched local treatment.

Conclusion

The foregoing outline has been directed to the separation of two distinct clinical groups of eczema from a functional state of the sebaceous glands, and to classify them as definite types each with its particular aetiology and evolution.

The position might be tabulated as follows:

	Seborrhoea	Pityriasis	Flexural Eczemas
Cause	Endocrine; ? <i>B. acnes</i>	? Yeast; ? <i>Staph. alb.</i>	? Streptococcus
Complications	Premature baldness; acne; rosacea	Localized eczematide (flannel rash); generalized eczematide	Multiple flexures involved; generalization by continuity; eczematide

PATHOLOGICAL SLEEP

THE PSYCHOBIOLOGICAL INTERPRETATION OF A CASE

BY

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In a recent case report Dott and Harrowes¹ rightly stressed the importance of assessing the part played by physical as well as by psychological and environmental factors in the production of a paranoid psychosis. While we do not necessarily agree with the aetiological value which they attached to the various factors ascertained in the case, their report is of considerable value, because it clearly demonstrates how unsatisfactory are dualistic conceptions in clinical psychiatry and how impossible it is to shut off "functional" and "organic" types of reaction in water-tight compartments, even if one permits oneself to use these terms for description purposes. With the growing recognition of this fact it seems a pity that the psychobiological conceptions of Adolf Meyer,² although by no means unknown in this country, are not more wholeheartedly accepted for purposes of practical interpretation and understanding of abnormal life-reactions arising from any set of circumstances.

Not only do Meyerian principles permit an unbiased evaluation of any factor which may influence the patient, but they seem to us to provide an intelligible link between the field of clinical psychiatry and the concepts of neurological functioning which have grown from the teachings of Hughlings Jackson and Sherrington. Meyer² acknowledges that his concept of the individual as a functioning biological unit, resulting from the integration of various "levels" of function, with something new emerging at each level over and above the sum of the levels below, owes much to Hughlings Jackson's well-known concepts of functional levels in the nervous system. "Mind" is regarded as the "subjective economizing function" of the individual as a whole, which cannot, of course, be understood except in relationship to the life-setting in which that function and its integral subfunctions are carried on.

There is no need here for dualistic mysticism or water-tight compartments of "functional" and "organic" forms of illness; but a simple study of what is happening at the various levels in a functionally integrated living thing, and an assessment of their value in maintaining or failing to maintain a "working agreement" as between the living thing and its cultural environment (Macfie Campbell)³—a simple record of fact undisturbed by passing philosophies and open always to receive addition to our knowledge. To get this assessment right the time relationship between disturbance of internal function and the various changes in the external load upon the individual as a whole is of paramount importance.

A case of pathological sleep is recorded here in which, in our view, the coincidence of acute encephalitis with a severe emotional trauma actually saved the patient from a deteriorating psychosis. It provides a striking contrast with the case of Dott and Harrowes, where a mere peripheral neuritis, coming when it did, was the starting-point, or at any rate the *point d'appui*, of a severe paranoïdal psychosis.

Under a "functional or organic" philosophy it is quite impossible satisfactorily to reconcile these two cases as belonging to the same category, or indeed as belonging to any category at all. Yet each is an example of a biological failure, the milder failure associated with a

gross central nervous lesion, and the more severe one with a simple peripheral lesion at the sensorimotor level. That the application of Meyerian principles to each case renders it intelligible is surely convincing evidence of their practical clinical utility.

The literature concerning the narcolepsies has been already so admirably summarized by Kinnier Wilson⁴ that it would be superfluous to attempt any recapitulation here. Levin⁵ has added substantially to the reported cases in recent years from time to time. The pathological states associated with the narcoleptic-cataplectic series of reactions include among many other conditions, infections, endocrine disorders, changes underlying certain of the epilepsies and psychopathological disturbances, and, as Wilson points out, it is impracticable to isolate narcolepsy as a *morbus sui generis*.

Report of the Case

A single woman aged 26, formerly a nurse, suffered for three years. She was under our observation in hospital for nine months, the attacks of diurnal sleep lasting from an hour to several days, with occasional "toneless" attacks. She had epistaxis and spastic photophobia resembling oculogyric crises. There were changes in the cerebro-spinal fluid. The intelligence quotient was 75. Objective examination of psychic processes was undertaken by word association tests and the use of the psycho-galvanometer. She was of diminutive stature. The sugar metabolism was disturbed.

Family History.—She is the twelfth child of an epileptic psychotic mother and an alcoholic father. Four of her siblings died from tuberculosis.

Previous Personal History.—She had a healthy childhood and adolescence, and reached Standard VII at school. She subsequently lived at home, and refused to go out to domestic service. The home life was not happy on account of the father's drinking habits, and the whole family were extravagant and improvident. There were numerous quarrels. She was described as conscientious and industrious, sociable but sullen, bad-tempered and wilful, thinking that she "knew everything," and resentful of criticism or advice.

Onset of "Sleepy" Attacks.—In 1929, owing to financial stress, she went to London and worked, first as a ward maid in a hospital and then as a probationer nurse. Towards the end of 1930 she had acute appendicitis, and was operated on at the London Hospital. Just before her preliminary nursing examination (in the autumn of 1931), when she was feeling the strain of extra work, she heard that her mother had been certified insane, and this is said to have upset her very much. She began, almost immediately, to suffer from overpowering drowsiness, so that she was unable to keep awake on duty.

FIRST HOSPITAL ADMISSION

She was admitted to St. Bartholomew's Hospital on November 1st, 1931, complaining of abdominal pain, epistaxis, headache, and drowsiness. There was some photophobia on admission. The physical signs in the central nervous system were normal, including the ocular fundi. The blood Wassermann reaction was negative. She became more lethargic, and developed rigidity of the limbs. The cerebro-spinal fluid findings were as follows:

November 6th. The fluid was clear, with no clot on standing. The cell count showed 26 leucocytes per c.mm. (60 per cent. lymphocytes and 40 per cent. polymorphs). The protein percentage was 0.02; the sugar reduction was normal; the chloride percentage was 780 mg.; and the globulin was not increased.

November 8th. The cell count was 132 per c.mm. (98 per cent. lymphocytes and 2 per cent. polymorphs). An injection of 8 c.cm. of the patient's own serum was given intrathecally.

November 11th. The pressure was 170 mm. The cell count was 176 leucocytes per c.mm. (60 per cent. lymphocytes and 40 per cent. polymorphs). There were 24 erythrocytes per c.mm., and the protein percentage was 0.04. The sugar showed diminished reduction. The percentage of the chlorides was 700 mg. The globulin showed no increase. No organisms were seen in a Gram-stained film of the centrifugalized deposit.

A diagnosis of encephalitis lethargica was made.

During convalescence she had persistent spastic photophobia and retention of urine—manifestations which were at the time thought to be hysterical. She was discharged on February

25th, 1932, as "Well, but still a mental case," and returned home, giving up all thought of further work. She remained well until August, 1932, when she had a return of her former symptoms.

SECOND HOSPITAL ADMISSION

She was admitted to a large provincial voluntary hospital on August 27th, following twenty-four hours' drowsiness and epistaxis. On admission she was very drowsy; the eyes were tightly closed, and she resisted efforts to open them. They turned upwards, but she could look down when asked to do so. No abnormality was found in the physical signs of the central nervous system. The ocular fundi were normal. The cerebro-spinal fluid findings were as follows: fluid clear, no clot; cells, 1 per c.mm.; protein, 30 mg. per cent.; glucose, 46 mg. per cent.; globulin absent; chlorides, 760 mg. per cent.; and the Lange curve negative. She was discharged on October 3rd with the diagnosis " ? hysteria."

She developed a trance-like state in January, 1933, and was in bed at home in this condition for six weeks. The history states that this attack had a sudden onset, that she lay in bed with her eyes closed, apparently sleeping, but able to ask for anything she wanted, and enjoying having visitors. She was not able to stand or to feed herself. She went out shopping the day after she got up, and appeared to be quite normal. Towards the end of 1933 she became depressed and irritable, resenting being questioned in any way. She suffered for a short time from auditory hallucinations, hearing her name being called so persistently that she would go from room to room trying to locate the voice.

THIRD HOSPITAL ADMISSION

She again became drowsy and lethargic, and was admitted in this condition to the same provincial hospital on January 3rd, 1934. She was seen there by one of us (I. S.) a fortnight after admission. She was said to have been asleep almost continuously since admission, but to have been capable of being roused, although not completely, at least to the extent of being able to take food and attend to her toilet habits. On examination she was found to be asleep, but was aroused quite easily to apparently full and clear consciousness; she was able to converse, admittedly with a tendency to reticence, in an ordinary way. She gave a reasonably clear account of herself, and described in retrospect the auditory hallucinations mentioned above. She was in a state of complete muscular relaxation, and made practically no spontaneous voluntary movements save those of speech. She was fairly easily persuaded to stand up and walk. She appreciated that she was ill, and readily agreed to come to a mental hospital as a voluntary patient. Before one had finished washing one's hands she was apparently asleep again.

FOURTH HOSPITAL ADMISSION

On arrival at the mental hospital (January 18th) she was awake. Physical examination showed a height of 4 ft. 9½ in., and her weight was 7 st. She was of poor physique, pale and puny, and had a moderate degree of myopia; her teeth were irregular and carious. No evidence of disease was found in the cardiovascular, respiratory, or alimentary systems, and no abnormal signs in the central nervous system. Retinoscopy results were normal.

The serological findings were as follows. The Wassermann reaction was negative in the blood serum and the cerebro-spinal fluid. On January 31st, 1934, the cerebro-spinal fluid was clear; the Nonne-Apelt and Pandy tests were negative; the protein percentage was 20 mg. and that of sugar 65 mg.; there were 4 cells per c.mm., and the Lange gold curve was 000½0000005. On October 11th the fluid was clear; the two tests were again negative; the protein percentage was 10 mg., that of chlorides 750 mg., and that of sugar 92 mg., and the Lange gold curve was 000½½000005.

A blood count taken on March 7th, 1934, showed a moderate lymphocytosis. The red blood cells numbered 5,690,000 per c.mm., and the white cells 11,200; the haemoglobin percentage was 94, and the colour index 0.84. A differential count showed: polymorphs, 54.5; eosinophils, 2; small lymphocytes, 36; large lymphocytes, 4.5; monocytes, 3. The count was repeated on July 6th, and was normal, the red blood cells numbering 5,350,000 per c.mm., and the white

cells 9,600; the haemoglobin percentage was 95, and the colour index 0.91; the differential count showed polymorphs, 71.5; eosinophils, 2.5; small lymphocytes, 18; large lymphocytes, 4.6; monocytes, 2.5; and basophils, 0.

The glucose tolerance test on February 7th showed a delayed curve, and the hyperglycaemic index was 90%; on March 6th it was 16. The blood urea test was 27 mg. On March 29th the urea clearance test gave a figure of 57 per cent.

X-ray examinations revealed that the skull and accessory sinuses were normal.

Mental Examination

Her general behaviour presents no peculiarities beyond a tendency to shy giggling and an over-compensation for her diminutive size, which shows itself in an exaggerated desire to excel in the physical culture classes held at the hospital and in a certain amount of posing when playing the piano. She is on friendly terms with those about her, but always on the fringe rather than in the centre of any social group, seldom initiating new ideas and apparently content to play the part of an appreciative audience. Since her admission to hospital there has been no evidence of the bad temper noted in the history.

The stream of talk is clear and coherent, but interrupted by unnecessary giggling; there is a tendency to shy reticence. The affect is one of self-satisfaction and complacency, with absence of initiative and an acceptance of her present position with indifference. She states that she is "quite happy," and her favourite answer to any question affecting her welfare is "I don't mind."

Her content of thought is shallow and apparently restricted to the trivialities of everyday life. She describes herself as "an independent sort," by which she means that she "keeps her secrets to herself." She says that she is easily upset by quarrels, is self-conscious, and prone to blush. She has had no love affairs, and says that she is "not the sort to bother with that sort of thing." There is no evidence of pathological fantasy formation, and she is free from delusions and hallucinations.

Patient's Description of Attacks

She describes her sleepy attacks as follows: "long ones" when she feels ill and is usually worried or upset, and "short ones" which follow excitement, often hearty laughter. The latter are sometimes accompanied by "weakness in the knees," so that she is afraid of falling (although she has never done so), and are followed by slight drowsiness until after the next night's sleep. The attacks appear to her to be just like ordinary sleep, are unassociated with dreaming, and do not in any way interfere with her normal sleep.

She stated that before the first she had been very unhappy about her mother, and that the last attack before admission to hospital had followed a visit to her mother, who is bed-ridden and in a state of advanced dementia. (Incidentally her mother is the only person toward whom she displays normal affection.) She cannot account for the other two series of attacks beyond saying "It was rather miserable at home," and that there "had been a few quarrels."

Intellectual Functions

Orientation is correct in all spheres. No defect in memory was noted except for patches of amnesia in respect of waking moments occurring in the course of prolonged attacks of sleeping. She fails to subtract seven from one hundred serially; is very poor on the ordinary retention tests; and she made absurd errors in simple calculations.

The I.Q. determined by the Stanford revision of the Binet-Simon tests is 75, and the mental age is 12 years. The test shows a moderate degree of scattering.

The word-association test proved of interest, since she displayed a degree of perseveration together with a distractibility, apparently in response to inner associations, which Jung and Riklin⁷ find typical of twilight states.

EXAMPLES ABSTRACTED FROM THE TEST

(1) *Perseveration* (the stimulus words were consecutive in the test)

Stimulus	Response	Time in Seconds
Death	Fade	5
Tall	Garden	2
Open	Rain	2
Sick	Wind	1
Love	Sunflowers	3

(2) *Inner Distractibility*

Stimulus	Response	Time in Seconds
Shame	Knitting	2
Fit	Tide	3
Money	Sunshine	2
Mirror	Tea	2
Day	Shop	2
Snake	Book	2

She is quite unable to account for these associations; indeed, she became increasingly inaccessible throughout the test. Although amiable, she remained completely indifferent, and failed to co-operate in any way, thus showing a characteristic shrinking from reality because of the greater emotional value of her inner thoughts.

The psycho-galvanic reflex showed a generally diminished affectivity, with complex indicating responses to "mother" and "drink," clearly indicating the emotional value of the home situation.

Stimulus	Response	Time in Seconds	G.D.
Mother	I don't know one for that	40	1
Pretty	Nice	8	0.6
Drink	I can't think of anything	30	0.4
Naked	Cold	2	0.4
Home	Dark	3	0.6

Subsequent Attacks and Clinical Progress

After admission she had several minor attacks of diurnal sleep, of which the following are examples. The first followed immediately upon lumbar puncture, when, from being apparently in her normal health and up and about, she became drowsy, and eventually fell into a condition indistinguishable from normal sleep. She could be roused by ordinary stimuli but resented interference; when roused she complained of headache and left-sided abdominal pain unaccompanied by physical signs. She remained in this condition for six days. She was then persuaded to get up, when she immediately became free from symptoms and resumed her usual activities. This sequence of events has been repeated when she has been confined to bed for other laboratory tests, but she is now induced to get up as soon as the test is over, without ill effect.

Other attacks have occurred in immediate response to laughter, and on one occasion, when she was found asleep in the forenoon, she affirmed that this was due to her "getting a bit excited thinking over some fun" that had occurred the previous tea-time. Whether this was so or not, no other precipitating cause was forthcoming.

Another attack occurred following her giving notice of her intention to leave hospital early in March, 1934. Her father had been worrying her to leave; she gave notice chiefly in response to his wishes, and because she felt it to be her duty to keep house for him. She was, however, half-hearted and worried, and finally arranged to discuss the question with him on the following day. When the day arrived she "forgot" to keep an appointment with one of us, although reminded to do so, and went walking in the grounds with another patient. While out and carrying on an ordinary conversation she became suddenly intensely drowsy and felt her knees

giving way. Her companion stated that she had to support her and keep walking her on the way back to the ward. Once there she fell into a heavy sleep. When the father arrived he found his daughter the centre of attraction to all patients in the ward. She roused herself sufficiently to tell him she felt very ill, and allowed him to persuade her to withdraw her notice. She subsequently suffered from headache and malaise for forty-eight hours, at the end of which time she again appeared free from symptoms.

In June, 1934, she complained of pain and tenderness in the right parotid region and over the right mastoid; there were no constitutional symptoms, and repeated examination by the surgeon and the oto-rhino-laryngologist revealed no objective evidence of disease. For some weeks she insisted on wearing a scarf round her head, saying that she experienced severe pain if she left it off. She received the news of her mother's death in July with marked apathy, but later had two or three attacks of twitching of the right arm and shoulder.

There was a superficial breaking down of her appendectomy scar on two occasions. The appearance of the wound suggested that this was self-inflicted, and the condition yielded readily to treatment when she was under strict observation.

In the autumn of 1934 she again had an attack of spastic photophobia, during which the eyes were turned upward but could readily move in any direction. This condition yielded to suggestion measures; in fact it was "cured" by boric lotion in a few minutes. She remained complacent and contented, singing as she performed simple household tasks in the convalescent villa of the hospital.

Comment

The most striking thing about the attacks of sleepiness is their purposive defensive nature. The first one saves her from the humiliation of failing in an examination which—with an I.Q. of 75—she is unlikely to pass; it also provides her, in sleep, with an escape from emotional trauma of her mother's frank insanity. On the cerebrospinal fluid findings at the material time there can be no possible doubt that she was suffering from an organic central nervous lesion. It would appear reasonable to accept the diagnosis made then that she was suffering from encephalitis lethargica. This is the crux of the satisfactory understanding of the case.

It so happened that when this ill-endowed woman most needed an avenue of escape, when she was on the verge of breaking her "working agreement" with her cultural environment, chance provided her with a temporary removal from the sphere of conscious activity by inflicting upon her an organic lesion which gave her no option but to retreat from the field of conative endeavour. It is unnecessary to indulge in convenient anthropomorphizing of the unconscious. She went to sleep not because she "unconsciously" wanted to do so, but because, by the very nature of the organic lesion, she could not have done anything else.

Whether or not Pavlov's theory of sleep⁸ is consistent with Head's concept of the "vigilance"⁹ of various levels of function waiting to take command of the "final common path"—a concept cunningly translated into psychobiological terms by Jelliffe¹⁰—here, there is no doubt that "something which happened" (that is, encephalitis) released certain "patterns of function" at the subthalamie and striato-spinal levels, so that they did in fact take command of the final common path and dominate the whole behaviour of the individual for the time being. Because of its time relationship to events in her environment this change in the *milieu intime* modified the patient's whole subsequent life.

The second and third "long attacks" followed unpleasant scenes at home. Note what had happened. She gave up nursing after the first attack, and reduced the load upon herself by returning to a domestic existence which was within her adaptive powers; but as soon as the load is increased by her having to face up to a domestic "scene" she has another attack.

It may be suggested that these were imitative of the first attack, and were examples of malingering. But the essential point is that she was now using the "pattern" of a previously inflicted organic lesion to provide herself with an escape from reality. Whether this was done consciously is, from the biological point of view, quite irrelevant; who is to say that behaviourists would be wrong if they suggested that this sleep "pattern" was becoming a condition reflex? That is, in practice, what it amounted to. The thing was becoming a habit, probably in the neurological as well as in the behaviouristic sense of the term.

Note that just before the onset of the third attack there was a brief period of hallucinosis, associated with irritability and depression, and followed almost immediately by a "long" attack, with stuporous features. A hint is here of a schizophrenic pattern taking command, but clinically different in that responsiveness was easily evoked on stimulation; she was sufficiently in contact with reality to look after her own comfort. One would not have been surprised had this girl developed schizophrenia, for there is undoubted evidence of a schizoid pattern in her; but chance, in the form of encephalitis, selected a narcoleptic rather than a schizophrenic pattern by which her emotional load could be rendered bearable.

The "short attacks" are difficult to trace in the history; but it is certain that they did not precede the first two "long attacks." As personally observed, they also were defensive in nature, with the possible exception of the one which followed "thinking over some fun." It is very striking that one of the few cataplectic or toneless attacks which she had in hospital arose on an occasion when she was going to be forced back into unpleasant reality by discharge from hospital. She could not have known of the clinical association of narcolepsy and cataplexy, nor of the association of these conditions with epistaxis. In our view, these considerations rule out malingering in the sense of conscious production of the attacks.

The fact that she had twitching—apparently involuntary—of the right arm and shoulder after the death of her epileptic mother is a matter for interesting speculation. Was it an identification in a known suggestible subject, or was it another coinciding of organic change and environmental circumstance?

Diagnosis

From what did this girl suffer? We do not believe that any static categorical diagnosis can give satisfaction. Encephalitis?—Yes, but that was not all. Hysteria or narcolepsy?—Yes, but on what basis? Mental deficiency?—Yes, but she was not so defective that she could not manage as a hospital maidservant. Was she psychotic? At any rate her behaviour was periodically such that she could not maintain her place in society, but what formal psychotic category meets her case? Add to this that she had an endocrine dyscrasia, and possibly an Adlerian mechanism in respect of her diminutive stature. We see how incapable are formalized diagnostic categories of rendering the case intelligible, and how easy it is to be side-tracked by specious over-valuation of transitory changes in the blood picture or in the sugar metabolism, so closely wooed by the "physiogenic" psychiatrists.

For descriptive purposes we might say that she suffered from "psychosis with gross brain lesion," or, in Meyerian terms, that an oligergastic individual had become dysergastic. The Adlerians would have something to say about a "will to power"; the Freudians could scarcely fail to be lured by the obvious narcissism and mother-identification; while the sleep pattern would doubtless be seized upon by others as a survival of archaic hibernation. If she escaped from the clutches of the "septic focus" school with her carious teeth still in her head she would be fortunate; but, notwithstanding the retention of these deadly poison producers, her lymphocyte count returned to normal in due course. Her stature and her sugar reactions would no doubt have proved of absorbing interest to the endocrinologists; in fact, almost any school of psychiatric theory would welcome her case as a convincing demonstration of the validity of its teachings.

In the sense that there is truth in each of these theories we believe that they are all right—it depends entirely upon the aspect of the individual which one is considering. But the task of the clinical psychiatrist is to understand how the patient got into the condition in which she is seen; only then is he in a position to determine what factors are capable of modification, so that the "working agreement" between the patient and the cultural environment is once again operative.

There is no need for ingenious theory; a simple chronological record of her life, together with a conception of levels of function and of integration, of the adaptative function of the nervous system, and of the final common path, appears to us to be sufficient.

Despite her gross organic handicaps she reached a stabilized condition in the convalescent villa of a mental hospital, remaining there of her own volition, doing useful work, happy and contented, enjoying parole beyond the grounds, and going to entertainments. She found, in fact, a new milieu with which her damaged adaptative mechanism could reach a working agreement, and which, we believe, she would never have reached if she had not been forced by gross temporary organic disablement to retreat from an endeavour quite beyond her natural capabilities. Who knows but that she too might have developed a paranoid schizophrenic state had she been stricken with peripheral neuritis instead of encephalitis lethargica.

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FRACTURE-DISLOCATION OF THE CERVICAL SPINE AND ITS OPEN REDUCTION

BY

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Recent circumstances have prompted me to publish the following case, which, though belated, has this advantage, that time has justified what was thought to be a dangerous experiment.

Brief Synopsis of Case

A man aged 21 sustained a crush-fracture dislocation of the cervical spine, causing root pressure and gross deformity of the neck. He was invalided from the Army. One year later an attempt at reduction by traction was made, and failed. After careful study on the cadaver the dislocation was almost completely reduced by exposure of the front of the spine and direct leverage of the dislocated vertebra combined by traction. For fourteen years he has followed the occupation of a van driver and salesman.

Clinical History

A private in the R.A.M.C., on May 8th, 1915, at Steenwoode, was marching at the rear of a column when he was run into by a car, which forced him into a sitting position. He was taken to hospital with loss of power in the arms, inability to move the neck, and a severe scalp wound. The scalp wound was treated at the hospital, but little attention was given to the neck, which he was told was sprained. On evacuation to a general hospital in England his neck was x-rayed, and it was then found he had a partial dislocation of the fifth cervical vertebra forwards. He was later discharged with full pension.

Towards the end of 1915 he was seen at the 1st Northern General Hospital for pension board. His condition was pitiable. He had pain in the neck, shoulders, and arms. His head was bent forward, so that his chin was almost on his chest and he had to support his chin with his

hands, and had considerable difficulty in sitting or lying. He was ready to consider any form of treatment which might give him some relief, and was admitted under me at the 1st Northern General Hospital in April, 1916. It was proposed to attempt reduction by traction, and if this failed, as seemed likely after one year, an open operation was to be done. A poroplastic bed was made for the upper half of his back and head.

Operative Treatment

The first operation was performed on May 27th, 1916, under general anaesthesia. A sandbag was placed behind the shoulders and lower part of the neck, and with the head hanging over the end of the table strong traction was made on the head, with such manipulation as was considered advisable. It seemed doubtful if any improvement had been made in the position, although on x-ray examination the deformity seemed somewhat diminished. A trial exposure of the front of the fifth and sixth cervical vertebrae was made on the cadaver, and it was found that good access could be obtained to the fracture site and that direct leverage could be carried out.

A second operation was performed on June 10th, 1916. An incision was made from the angle of the jaw to the sterno-clavicular joint. The sterno-mastoid was retracted outwards and the carotid sheath and pharynx displaced mesially. The forward dislocation of the fifth cervical was readily recognized. The anterior common ligament was incised and the end of a flat metal bar, about one and quarter inches broad, inserted between the bodies of the fifth and sixth cervical. Direct leverage, combined with traction and manipulation, appeared to restore the vertebrae to a normal relationship.

The patient was immobilized for some six weeks in his poroplastic mould, and later allowed up with a cervical support. A further x-ray showed an almost complete reduction. He was before various medical boards, and was given a final award of 50 per cent. disability in 1922. He had previously started as a tobacconist, but his business failed.

About this time, as he was much improved, he started training for a van driver and salesman. Before this a medical examination was necessary, and he was at first