The effect during the application was greatly to increase the noise, the patient stating that it appeared to come from a corner of the roof.

On the 29th, the patient stated that after the operation he was free from noise in his head for about nine or ten hours, and that it recurred on his going to bed. The operation was again repeated for about seven minutes with a similar result, namely, total cessation of noise for a period of ten or twelve hours. The galvanism was accordingly continued for about ten minutes, daily, for a fortnight, the noise remaining away for a gradually longer and longer period, till it ceased returning altogether. Relieved from these distressing symptoms, the patient soon began to occupy himself industrially, and is now quite convalescent, having to a great extent recovered his former cheerfulness, to which he has been a stranger for eleven years and a half.

On the Pathological Elements of General Paresis or Paresifying Mental Disease (*Paralysie générale*). By Dr. E. Salomon. Translated from the original Swedish, by William Daniel Moore, M.D. T.C.D., M.R.I.A., Honorary Member of the Swedish Society of Physicians and of the Norwegian Medical Society, Corresponding Member of the Royal Medical Society of Copenhagen.

INTRODUCTION.

General paresis, paresifying mental Disease, or in Latin *paresis generalis,* that is, paresis of mind and body, *insania paresans,* are terms applied to the form of mental disease generally known under the French denomination of *paralysie générale.**

The synonyms of this disease are particularly numerous. Among the most important names in use with authors I may enumerate the following:—dementia paralytica; paralysia generalis progressiva; paralysis progressiva; anoia paralytica; (1) dementia paralysans. (2) The French have called it, aliénation ambitieuse avec paralysie incomplète (Bayle); démence paralytique; folie paralytique (Parchappe); paralysie générale incomplète (Calmeil); paralysie générale progressive; &c. The Germans term it Geisteskrankheit mit Paralyse; allgemeine progressive Gehirnlähmung; paralytischer Blödsinn; &c.

* "Paralysie générale" is a singularly inappropriate term; for he who is generally paralysed is certainly dead, and not living.

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The English call it simply general paralysis. (3) General paresis * occupies a prominent place among affections of the mind, by reason of the great interest presented by this form of mental disease in a pathological point of view.

The knowledge we at present possess of this singularly constant morbid process, and its essential nature, may be regarded as a vantage ground, whence scientific investigation may advance in the still uncertain field of mental diseases.

Calmeil says :—"Le diagnostic anatomique des lésions, qu'on doit s'attendre à rencontrer dans les cavités crâniennes des individus affectés de périencéphalite chronique peut prendre rang parmi les vérités les mieux établies de la pathologie humaine." (4)

Even if this statement cannot be taken literally, it shows that the assiduous labour which has been bestowed upon the investigation of the pathological anatomy of this disease has not been without result.

In order at the present day to obtain the recognition of an affection as an independent form of disease, it is not sufficient to exhibit a certain group of symptoms; we must at the same time be able to show that these symptoms spring from one and the same source.

The pathology of every distinct disease must therefore consist of two parts: the symptomatic (or physiological), and the anatomical.

I shall make this division the basis of my essay and shall therefore commence with the symptomatic pathology, to which is appended a chapter on the differential diagnosis of the disease. I shall then pass on to the anatomical pathology, and shall conclude with an investigation of the essential nature of the disease.

I. SYMPTOMATIC PATHOLOGY.

I. SKETCH OF THE DISEASE.

In the very commencement of the cerebral morbid process which constitutes the subject of the following essay, the mind appears injured in the conditions fundamentally necessary to the normal discharge of its functions; it is diseased in its very root.

The degenerative process which takes place in the cortical substance of the brain, (5) prevents the normal reproduction and association of ideas; so that all combination, or any adequate comprehension of circumstances, the apprehension and conception of the most ordinary phenomena, are rendered impossible.

On this depends the peculiar change in the patient's behaviour: the astounded, vacant look, with which he glances around; the difficulty, or absolute impossibility of performing the simplest mental operations. The patient has scarcely swallowed the last morsel of a copious meal, when he demands more, assigning as a

* παρεσις,=paralysia incompleta, imperfecta.

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reason that he has got no food during the entire day; he wishes to go to bed in the middle of a bright day, because it is evening, &c.

This stamp of devastated intelligence general paresis maintains during its whole course, whatever form of other mental disease it may assume. There is scarcely any form of mental disease under whose colours general paresis may not advance. Oftentimes it presents itself to observation as an eccentric, multiform, alternating ambition, with or without maniacal exaltation; very frequently it occurs with a melancholic state of mind manifest in the patients' outward demeanour. False ideas of external greatness are also to be discovered, although the patient does not spontaneously give utterance to them. The disease may likewise run on with an unmeaning loquacity, without any definite or typically marked delirium, and with alternating fits of exaltation and comparative calmness of mind. Some cases have been observed under the form of a more apathetic mental torpor, with intercurrent, rapidly transient ebullition of feeling and hallucinations of various kinds.

Notwithstanding that from the first commencement there is a decided diminution of intelligence and of the power of judgment, the frequently recurring states of exaltation, the constantly varying false ideas, hallucinations, and illusions, often present a remarkable variety in the disease on its first appearance. Even if we leave out of view the motor disturbance constantly attending the affection, paresifying insanity is thus distinguished from every other form of lunacy.

Accordingly as the cerebral disorganization advances, the active alternation of phenomena gradually diminishes, while the manifestations of the cerebral lesion become the most striking. The functions of sight and hearing do not in ordinary cases, when the disease is not very far advanced, exhibit any very remarkable change. But towards the close of the third stage, the power of hearing usually diminishes. In the rare instances in which the patient lives to the fourth stage sight and hearing become finally annihilated. Hallucinations (endogenous sensations) are not unfrequently met with in these senses. Smell and taste are often altered, so that the patient without repugnance submits to their operation the most loathsome things. Hyperæsthesia of the skin may possibly sometimes be observed, but it does not belong essentially to the disease. The sensibility of the skin often continues perfectly normal, even in the third stage; but in most cases it is blunted in some degree proportionately to the advance of the motor disturbance. This blunting, however (except in the fourth stage), never amounts to complete insensibility.*

The motor disturbances exhibit a vast number of changes and varieties. Even in the first stage, we observe more or less of transient

* The occasional suspension of perception must be distinguished from loss of sensibility.

convulsive movements (involuntary spasms) in the muscles of the face, especially in those of the upper lip. Sometimes the setting in of the disease is marked by sudden fits of vertigo or transitory attacks of an apoplectic character. Again, there is a more interrupted, involuntary, as it were, jerking movement in the lips; creeping sensations in the tongue (fibrillar convulsions in the muscles of the organ), when it is protruded; the patient betrays a certain amount of difficulty in expressing himself, evidenced by a laboured and catching mode of delivery, and a difficulty and occasional complete inability to pronounce words abounding in consonants, which require a more combined action of the muscles engaged in articulation. The patient still walks quickly, but sooner or later he experiences uncertainty in his gait also. It becomes insecure and staggering, causing him to walk with a feeble step and straddling stride (sailor's walk). This is more apparent when he is suddenly called and attempts to turn; the lower extremities now begin to give way under the weight of the body; the power of combination for its movements is interrupted. If the patient has advanced somewhat into the third stage, it happens that when he attempts to get out of bed his knees sink together, and he is for a time paralysed, but again recovers. After such attacks the power of motion in the lower extremities gradually diminishes, so that if he reaches the fourth stage he can no longer leave his bed. A similar condition occurs, in the progress of the disease, in the muscles of the upper extremities. In the last stage the muscles connected with the expulsion of the excreta and with deglutition no longer perform their office.

The vegetative functions usually continue rather long undisturbed. But with the gradual diminution of nervous influence nutrition also declines, and emaciation attains a high degree. In many instances an atrophied state of all the parenchymatous organs is met with on post-mortem examination. Of the diseases which interrupt the paresis, and cause death before the disease has reached the fourth stage, pyæmia, pneumonia, and colliquative diarrhœa, are the most frequent. Gangrenous destruction of the parts of the body exposed to more considerable pressure (the sacral region) is an almost constant phenomenon.*

The course of the disease may extend from some months to three years. In rarer cases it may reach to five years, but scarcely ever exceeds that time.

The disease belongs especially to full manhood, and in normal cases is not developed before the age of thirty years.

It may in general be stated that it occurs in persons who have lived too fast, and have fallen victims to enervating excesses. It presents a ready picture of premature old age (senium l. marasmus præcox).

* Cf. Joffe, in 'Zeitschrift Wien. Ærtzte' 1857; 1, 2, 3, 5—1860.

France is the peculiar focus of the disease. The insatiable thirst after "la gloire" (outward distinction), which there more commonly than in other lands distinguishes the struggling young man, causes him to bend the bow too tight, and thus to be suddenly interrupted in his career. Paris is the head-quarters of the disease.

II. FORMS OF THE DISEASE.

We usually distinguish two separate forms or types, under which paresifying insanity occurs, namely, the *expansive* and the *depressed* form; of which the former has four varieties, the latter two. (6).

(A) *The expansive form* (l'affaiblissement masqué), generally occurs in men, and is distinguished by—

1. *The delusion of riches and greatness,* which gives the delirium a peculiar stamp. The false ideas are persistent, predominating, and of a progressive nature.

2. *Over estimation of one's own personality;* contentment and self-satisfaction; occasionally a rapidly transient expression of false ideas of riches and outward greatness.

3. *The notion of riches and greatness,* but with long intervals. The attacks supervene and disappear sometimes with the rapidity of lightning.

4. *A mixed expansive and depressed form,* with false ideas of riches and power.

(B) *The depressed form,* usually occurs among women and weak men.

1. *Melancholic type.*—The patient goes about with a depressed and sorrowful exterior, and when asked how he is, always answers, "I am exceedingly well." "First rate." Alternating delirium.

2. *Anæsthesia psychica,* characterised by a progressive decline of intelligence (stupidity).*

Under whichever of the above-mentioned forms the general paresis may occur, it is always and constantly attended with motor disturbances.

III.—STAGES OF THE DISEASE.

We recognise paresifying insanity under four stages of development:

1. Thestage of Mental Alteration.
2. The stage of Mental Alienation.
3. The stage of Dementia.
4. The stage of Amentia, the character of which is paralysis of the mind=Dementia completa.

* To this belongs the seventh series of cases of paralysie générale incomplète in Calmeil—for example, No. 67. This is a very rare, and not generally recognised form.

1. *The stage of Mental Alteration.*

(A) *Mental symptoms.*—The mind in this stage undergoes a change, the patient's conduct differing from what characterised him before his illness. The change affects especially the patient's temper, character, energy, and intelligence.

1. The *temper* is so changed that, from being comparatively lively, equable, gay, and steady, it becomes—*a*, irritable and impetuous; *b*, morbid, dull, and careless about everything relating to the patient's self and those about him; *c*, sorrowful; *d*, childish and rash. (7)

In the patient's mode of life the change described under *a* manifests itself by his becoming troublesome to those about him, causing them often to experience the outbreak of a certain choleric irritability (*"manie congestionnaire,"* Guislain). His morbid apathy prevents the patient engaging in any regular occupation. He neglects his duty.* His sorrowful humour gives rise to a retired and shy behaviour. His childish want of thought makes him constantly fall into extravagance, and leads him into undertakings and affairs which threaten, and too often actually cause, both his own and his family's ruin. The patient's actions are characterised by *leniter in re, sed fortiter in modo.*

2. The *character* (moral faculties) is so altered, that it becomes degenerated (moral insanity). The patient, even though he be a highly cultivated man, with fixed and settled character, becomes uncertain, dissolute, and dishonorable. He continues in the exercise of the duties of social life, but his surprised relatives mourn in silence over his indelicate acts, his dishonesty and debauchery. An honest man suddenly commits an open theft (8); so that he soon renders himself unfit for social life.

3. The patient's *energy* is changed, exhibiting a marked falling off. The power of deciding for himself diminishes; his acts are determined by external accidents; his conduct is so changed that from being steady it becomes extravagant.†

4. His *intelligence* is so altered that his power of criticism (judging of things in general) is diminished in comparison with its strength before his illness.

5. *Momentary absence of mind.*—The patient stops in the middle of a conversation, sometimes in the middle of a word, but continues, after some moments, the conversation from the point where the interruption occurred. He suffers, moreover, from a certain unusual dissipation of thought, and incapacity to collect his ideas.

6. *Forgetfulness* (=oblivion of what has just occurred).—This is a constant and important symptom.

* The representations of relatives against his irregular and whimsical mode of life have not the slightest effect ("l'apathie raisonnée").

† See the foregoing note.

7. *Morbid mobility and disquiet* in the patient's whole conduct, occasioned by the mental change.

8. *Indifference* in general to the subject for which in health the patient entertained a lively interest.

(B) *Paretic symptoms.**—The patient's capability of executing detailed movements diminishes. Movements *en masse* are performed with full power. Failing precision and diminished power of combination in muscular movements set in early.

1. *Speech.*—Alterations of speech are the first pathognomonic symptom of paralysis. The articulation becomes thick, loses in distinctness and precision, and suffers from a certain inaccuracy. Difficulty in plainly pronouncing some more complicated words, abounding in consonants, sets in.

2. The patient's gait becomes uncertain and tottering. He walks with a feeble step.

3. The handwriting is changed, the usual rounding being wanting. It becomes streaky and scratchy. The patient can no longer with his hands exercise any movements of a more complicated nature and which require much precision.†

During this stage the patient experiences involuntary spasms in the muscles of the face, particularly around the angles of the mouth and eyelids and in the upper lip. Rapidly transient attacks of vertigo. The pupils exhibit a constant contraction, not yielding even to diminished access of light (pin-point pupils). During the transition to the second stage maniacal seizures supervene (="*manie congestionnaire,*" Guislain), which, however, quickly pass off. In these attacks the patient is able to deal violent blows, &c., showing that in the strict sense of the word muscular power is not wanting, and that the muscles are not in themselves affected. Meyer has shown that in the attacks of mania occurring towards the close of the first stage the temperature of the vertical region is exalted. (9) Usually it is not until maniacal attacks have set in that the patient is considered to be insane. He is now admitted into an asylum, and is in the stage of mental alienation.

2. *Stage of Mental Alienation.*

(A) *Mental symptoms.*—The distinguishing characteristic of this stage is the confusion which, in consequence of abrogated power of judgment, the patient makes between his ideas and his desires, or his desires and ideas; he can no longer distinguish between them; they are for him quite the same.

* The paretic symptoms in the first stage are only a bodily expression of the incipient paralysis of mind. The energy of the patient's movements is relaxed. The cause is central. Cf. Gehirnlähmung.

† All these signs are of importance, only by comparison with the practice in the use of his muscles which the patient had before his illness.

1. The stamp of decline and weakness in his psychical activity becomes more evident.

2. Mania, frequently under the form of the delusion of riches and greatness (=*monomanie des grandeurs*).

3. More or less frequent maniacal attacks.

(B) *Paretic symptoms.* — The *speech* is not merely thick and stammering, but laboured, and occasionally completely interrupted; the same syllable is repeated several times before the patient can articulate it. He stops short in the middle of a word, endeavours to pronounce it, but finds difficulty in doing so. He then becomes vehement, but the greater effort he makes to complete the enunciation of the word or sentence, the more impossible it seems to be. The movements of the tongue which, in the former stage, were unaffected, are now somewhat impeded; fibrillar spasms in the tongue are also observed.

2. The patient's *gait* is much more uncertain than in the former stage. He walks with yielding knees and a wide step, but does not on this account the less frequently knock his knees together. He is glad to use a stick, or endeavours to lay hold of something which may serve him as a guide. He never walks in the middle of a flight of steps.

3. *The movements of his hands* are more limited. He finds it hard at the first attempt to lay hold of what he wishes to seize. If he has succeeded in getting it, he retains it for a time, but soon relaxes his hold.

4. The patient's *figure* collapses and often becomes at the same time crooked.

During this stage the pupils are constantly unequally dilated. Sensibility is somewhat blunted.

The delusion of greatness (=*monomanie des grandeurs*) has by French writers been looked upon as a pathognomonic sign of developed general paralysis. This I consider not to be the case, for although the ambitious form of mental alienation is the most frequent, it does not constitute anything essentially fundamental in the morbid process itself. It is not this formal point of mental alienation which determines the disease, but it is the progressive diminution of mental energy, and the simultaneously diminished power possessed by the patient in the employment of his motor organs.

I consider the confounding of ideas and desires to be the characteristic element in the stage of mental alienation. The patient accidentally sees a well-known face. The sight has directed his thoughts to this person; thought and wish are the same. If he is confined, he endeavours forcibly to get out, for he wishes to meet the person in question. His unbridled fancy leads him to wish himself a millionaire, a king, &c.; the wish and thought are for him the same. He fancies he has millions and a royal crown. As reality

is for the patient of subordinate, or rather, of no importance, he soon finds himself in fact* a millionaire, a king, &c.

A persistent delirium belongs to this stage. That which it is of importance to bear prominently in mind is the gradual development of the false ideas until they have attained their culminating point. If the patient be a king, he becomes God, supreme God, &c. Another progresses from baron to count, king, emperor, &c. A poor person begins by suddenly finding that he is possessor of fifty or a hundred thousand rix-dollars; he soon acquires million upon million, &c. When the progression of the delirium has ceased, and the patient can no longer produce anything new, but lives exclusively upon the old stock of false ideas, he has arrived at the third stage.

In the transition to the next stage, apoplectic attacks occur as accessory phenomena, after which the patient's condition always declines considerably.

3. *Stage of Dementia.*

(A) *Mental symptoms.*—The characteristic of this stage is the patient's incapacity to produce new ideas. The delirium has from being more acute passed over to the chronic form.

1. The mind becomes gradually weaker, with a tendency to fully-developed dementia.

2 Incoherent repetition of reminiscences from the false ideas of the preceding stage. It is, as it were, a mechanical repetition of isolated words or short sentences, as for example, "million;" "I am king."

3. Failing memory of the patient's past life.

(B) *Paretic symptoms.*—1. The power of speech is extremely limited. Towards the close it consists only in the muttering of thick, indistinctly articulated noises (10). The expression of the face is vacant. Now and then a silly leer plays over the patient's otherwise motionless features. There is difficulty in putting out the tongue.

2. The patient's gait is slow and dragging; his course is zigzag; in walking he turns in all directions. Towards the close he chiefly lies in bed, and, for the most part, on the back.

3. The relaxation of his hands has so increased that the patient cannot retain anything in them.

4. Involuntary discharges set in towards the close.

5. Hearing, and subsequently sight, diminish considerably.

Nutrition, which had hitherto continued undisturbed, rapidly diminishes, notwithstanding that the appetite is still voracious.

* For the paretic with mental alienation a fact = the object of their fancy.

Bed-sores form on the sacrum and hips. The sensibility is considerably blunted.

As accessory phenomena epileptic seizures (convulsions accompanied with loss of consciousness) occur during and towards the close of the stage (11.) The patient usually succumbs in the course of this stage.

In some rare instances it happens, when the patient has been nursed with exemplary care, that he survives to the fourth stage of the disease.

4. *Stage of Amentia.*

This stage represents the highest possible degree of human degeneration. The man dies while still alive, for it is only the animal which breathes and assimilates. The patient has attained the stage of brutalisation.

(A) *Mental symptoms.*—The senses have in this last stage of the disease ceased to discharge their functions; the patient can therefore no longer have any sensations. Psychical symptoms are consequently absent.

(B) *Paretic symptoms.*—These have attained their culminating point. The patient no longer possesses the power of speech. He is unable to walk, nor can he move from his bed. At last he cannot even change his position but lies motionless upon his back. He can take nothing in his hands. The masticating muscles are paralysed. The food has to be thrust down to the commencement of the œsophagus. The muscles of the trunk are paralysed, so that respiration becomes extremely slow. The movements of the thorax are scarcely perceptible. The impulse of the heart is feeble, and is observable only on accurate examination. The food often gets into the trachea, and suffocates the patient; or, in consequence of paralysis of the pharyngeal muscles, a larger or smaller bit becomes impacted behind the root of the tongue and compresses the epiglottis. The temperature of the skin is low. The bed-sores spread deeply, and often reach the subjacent bony parts.

A coloured drawing of this stage would form a horrible picture. The wreck of the unhappy man lies dumb and immoveable as a sack of flesh.* The man is in the fullest sense of the word "out of his senses."

Soon, however, death puts a long-wished for close to this extreme limit of human misery, as the patient is only a burden, a mass of fœtid lumber here upon earth (12).

* "Comme une masse inerte."—Guislain.

II. DIFFERENTIAL DIAGNOSIS.

We must, in the first place, distinguish paresifying insanity from other forms of mental disease; afterwards from other non-mental diseases in which paralytic symptoms occur.

1. *Paresifying Insanity compared with other forms of Mental Disease.*

If the pathognomonic paralytic symptoms have been recognised, there can be no confusion; supposing that these have not been duly apprehended, the question remains, how far the disease may be diagnosed from the psychical symptoms alone. This can undoubtedly to a certain extent be done. I shall endeavour to describe the most important elements in the diagnosis.

I do not consider that in the first stage the psychical symptoms present any reliable resting-ground. In the second stage the delirium is not specific with respect to its form; for ambitious delirium occurs not unfrequently in diseases in general. But in this form of delirium, in other mental diseases, the false ideas are fixed and unchanging (Conf. T. Fixerwahn). In paresifying insanity, the delirium is distinguished by an uninterrupted progress upwards to higher and more gigantic erroneous conceptions—in a word, it is a progressive delirium which is not met with in other cases. The character of confusion, or unity between ideas and desires, which I have stated as distinguishing the second stage, is peculiar to paresifying insanity. Mania paretica wants the character otherwise belonging to mania, of perfect intermissions. From the ordinary form of chronic dementia (= "démence franche") it is distinguished by the fact, that in the latter the patients are perfectly silent, while paretics, on the contrary, rave incessantly. In other respects, the dissimilar courses of the diseases present a striking distinction between them.

2. *Paresifying Insanity compared with other non-psychical diseases in which paralytic symptoms exist.*

Under this head I shall speak only of apoplexy, chronic alcoholismus and paralysis from muscular atrophy.

1. *Apoplexy.*—In a slighter attack of apoplexy, where the paralysis affects the tongue, it is exclusively or predominatingly unilateral, on which account the tongue turns to one side when it is protruded. Hemiplegia, paraplegia, &c., present not the slightest similarity to general paresis, for in such cases the paralysis is complete in the parts of the body affected, and moreover is partial and not general.

2. *Alcoholismus chronicus.*—General paralysis has almost invariably been confounded with this toxical disease. Even in the present day French writers especially confound these diseases in consequence of insufficient acquaintance with chronic alcoholismus. (13)

The group of symptoms included under the denomination dementia paralytica belongs essentially to paresifying insanity, but it may also be met with in chronic alcoholismus, when the latter has attained a higher degree of development. A man may arrive at dementia in many ways; dementia with bodily paralysis he may reach especially through general paresis or chronic alcoholism. When the patient has already reached the goal, it may often be difficult to say immediately, from the existing symptoms, in what way he has attained to it; but when information is afforded as to the course of the disease, the decision is as easy as it is certain.

The principal feature of the differential diagnosis is to be found in the dissimilar starting-points of the diseases. General paresis proceeds from a morbid process in the fine membranes of the brain; chronic alcoholism from a general intoxication. In the former case the psychical symptoms occupy the first place: the degeneration of the mind tends to produce that of the body. In the latter, the paralytic symptoms are the first: the general intoxication of the body tends to the degeneration of the mind. The dissimilar etiological source of the diseases differentiates them in a decided manner. A person who has indulged in an excessive use of brandy at length becomes poisoned, and in consequence thereof, becomes the subject of chronic alcoholism, but never of paresifying insanity. If he has at the same time indulged in enervating excesses, particularly in those of a sexual character (14), he may, in addition to his chronic alcoholism, acquire general paresis.

3. *Paralysis from muscular atrophy.*—This disease has been confounded with paresifying insanity. If this mistake is still made, it is attributable to deficient scientific knowledge in the physician. The diseases have this in common, that in both progressive paralytic symptoms proceeding from the muscular system (occur paralysie progressive.) In other respects they are wholly dissimilar. In the one the seat of the disease is in the brain; in the other it is in the muscles. Paretic patients may, under the influence of delirium, employ their muscles in a very violent manner; such a patient may dash in pieces the door of the room in which he is confined. A person suffering from paralysis from muscular atrophy does not rave, and, in consequence of the degenerated state of his muscles, cannot be violent.

III. PATHOLOGICAL ANATOMY.

I shall include the description of the pathological anatomy of the disease under four divisions, each being referable to a corresponding symptomatic stage;

1. *Leptomeningitis chronica* (16) (= the stage of mental alteration).
2. *Periencephalitis chronica diffusa* (= the stage of mental alienation).
3. *Degeneratio substantiæ corticalis cerebri* (or marasmus substantiæ corticalis = the stage of dementia).
4. *Atrophia vera substantiæ corticalis cerebri* (= the stage of amentia).

That the disease commences with leptomeningitis of a chronic nature is proved by the fact, that in the cases where the patient dies in the stage of mental alienation, signs of a still persistent or recently terminated inflammatory process are met with in the pia mater (= lepto-periencephalitis*). If the patient dies in the third or in the beginning of the fourth stage, we constantly observe a change in the pia mater, the result of a preceding leptomeningitis. The process indicated under 2, is recognisable by the increased volume (*"trübe Schwellung"*) of the cortical substance of the brain. The degeneration referred to under 3 has been demonstrated by Rokitansky. The atrophy mentioned under 4 is discoverable principally by the circumstance, that when the patient has lived to the commencement of the fourth stage, the most superficial portion of the cortical substance, corresponding to the lamina nervea in the healthy condition, is changed into cicatricial tissue, giving the sensation, on feeling with the point of the finger the now nearly obliterated surface of the convolutions, of a firm brain, and of a certain fluctuation of the subjacent dissolved cortical portion.

The honour of having demonstrated the anatomical changes in paralysis with mental alienation belongs to the Vienna school (Wedl, Rokitansky).

K. Wedl† has in every case of general paresis demonstrated an hypertrophy of connective tissue in the small arteries and veins in the pia mater and cortical portion of the brain. On the outer wall of the vessel is a hyaline, imperfect layer of connective tissue studded with partly scattered, partly grouped oblong or rounded nuclei. This layer of connective tissue, projecting over a greater or less extent of the vessel, undergoes, with the nuclei occurring in it, in the direction from without inwards (from the peri-

* A contraction of lepto-meningo-periencephalitis.
† 'Beiträge zur Pathologie der Blutgefässe.' Wien, 1859.

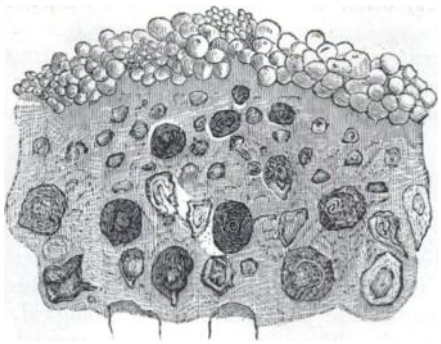
phery of the vessel towards its centre) a fibrillar change. The veins of capillary structure cannot resist the pressure, but are also drawn into this process, and are completely obliterated, and changed to corresponding bundles of fibres. The abnormal layer of connective tissue not unfrequently serves as a seat of deposit for finely divided olein and amorphous calcareous salts, while in other places calcareous depositions take place in the inner elastic and muscular layer. The small and slender cerebral vessels thus calcified can, on section, be observed in the cortical substance as a number of needle points. Wedl endeavours to explain the adhesion of the superficial layer of the cortical substance to the pia mater by the penetration of the grouped nuclei in the adventitious membrane of the pia mater to a certain depth into the cortical substance. When the pia mater is separated, a layer of the softened cortical substance often accompanies it, corresponding to the depth to which the nuclei have penetrated.

The complete obliteration of the calibre of the small veins caused by this degenerative process, demonstrated by Wedl, must give rise to a considerable obstruction to the circulation, both in the pia mater, and subsequently in the cortical substance of the brain, with consequent ischæmia;* to stasis, pressure, irritation, and inflammation. All this produces a progressive aggravation of the cerebral symptoms, and disturbs the nutrition of the cortical substance.

Rokitansky† has, in all genuine cases of paresifying insanity, demonstrated a considerable increase of the connective tissue enveloping the cortical elements. The pathologically augmented connective tissue is at first of a tough and viscid nature, and imparts to the cortical substance a somewhat looser consistence than exists in the normal state. The connective tissue subsequently, in the course of the disease, assumes a harder and more fibrous form. This excessive formation of connective tissue causes the breaking-up of the nerve-tubes. Those are first attacked which constitute the lamina nervea covering the cortical substance of the brain; afterwards those which horizontally traverse the same and separate the several layers of cortical substance; lastly, the degeneration attacks also the nerve-tubes, passing singly through the grey substance. The nerve-tubes broken up by the pathological process, are changed into colloid or amyloid granules (granular cells, granular bodies), which are met with in variable quantity in the extending connective tissue. The ganglionic cells of the cortical substance are often found dissolved, and in a state of colloid degeneration. See the subjoined woodcut (after Rokitansky):

* Virchow—ἴσχω=to check.

† 'Ueber Bindegewebeswucherung im Nervensysteme.' Wien, 1857.



Colloid (and amyloid) metamorphosis of the cortical substance in a person affected with paresifying insanity. The pia mater is represented as separated with loss of a portion of the cortical substance. In the cortical substance, the superior white filamentous layer (lamina nervea) is replaced by a layer of colloid corpuscles of various sizes; under this separate colloid granules lie in a mass studded with numerous granular nuclei. Lower down are ganglionic cells swollen or changed to colloid bodies.

The cortical substance has split asunder, and (in the third stage) yields to the least touch. In the transition to the fourth stage, the superior layer (corresponding to the lamina nervea in the healthy state) is in a firm and tough condition. The inferior layers still retain their pappy and soft state. The convolutions are now nearly obliterated, and the mass of the cortical substance is diminished in volume.

In consequence of this pathological process, set in action by ischæmia, determination of blood, hyperæmia, or inflammation, the grey cerebral cells become destroyed, and changed to an inert mass.

The constant changes met with in every well-marked case of fully developed *insania paresans*, are:

1. In the *arachnoid*, results of previous inflammation in the form of condensation, diminished transparency, &c.
2. In the *pia mater*, results of previous inflammation appearing as opacity and condensation of the vascular membrane.
3. In the *cortical substance*, the consistence is looser than is normally the case. It is often pappy and soft.*

In addition we frequently have:

4. In the *dura mater*, results of previous pachymeningitis exhibiting themselves in adhesion of the membrane to the inside of the calvarium, thickening, &c.
5. In the *calvarium*, thickening and hyperæmia.
6. In the *sac of the arachnoid*, effusion of variable nature.

* When the patient has died in the beginning of the fourth stage, the cortical substance may appear resistant, and normal to the touch. The most superficial layer must in that case be removed, before the dissolved state of the subjacent tissue can be observed (17).

7. *Pia mater*, often intimately connected with the cortical substance.

8. In the *ventricles*, more or less abundant serous effusion. If the changes enumerated under 1, 2, or 3, are not met with, the patient has had some other disease than *insania paresans* (18).

4. *Essential Nature of the Disease.*

The disease, whose pathological elements I have above described, is a mental disease, and has all the characters pertaining thereto (insania). It is an independent form of mental disease, for it has signs, both symptomatic and anatomico-pathological, belonging exclusively to itself. These are principally mental and paralytic symptoms, going hand in hand, and being progressively developed, with a dissolved state of the cortical substance.

Mental disease, whose expression is a disturbance in the action of the human mind, cannot exist without a morbid change in the organ of mental activity, viz., the brain. In this change science must seek the cause and essential nature of the disease in an anatomico-pathological point of view.

Two views have been entertained with respect to the essential nature of the disease, namely, the French and the German.

1. *The French view* regards paresifying insanity as an inflammatory disease, arising as the result of irritation produced by repeated congestions, and causing a disorganizing inflammation. The anatomico-pathological names given by French writers to the disease refer exclusively to this theory, as for example, Bayle calls it *meningitis chronica;* Calmeil makes it a *peri-encephalo-meningitis chronica diffusa;* Belhomme calls it *meningo-cerebritis;* while Parchappe has proposed to term it, *cerebritis corticalis generalis.*

2. *The German view* declares the disease to depend, as is shown by demonstrated facts, upon obstructions produced in the vascular walls (in the pia mater and cortical substance) by degeneration (hypertrophy); with their results, ischæmia and inflammation. The primary cause, therefore, is degeneration of the vascular walls. Hence proceeds derangement of the circulation, with its consequent disturbed nutrition. The secondary cause is a spreading and destructive excessive formation of connective tissue in the cortical substance, leading to the destruction of nerve-tubes and nerve-cells.

As long-continued cerebral hyperæmia may exist, without being attended with degeneration in the vessels of the pia mater, and excessive formation of connective tissue, it is clear that something more must also be present. This additional element is supposed to constitute the peculiarity of the disease, and to be of a degenerative nature (19).

The diffuse periencephalitis (general paresis) presents incontestably

a striking analogy to diffuse nephritis (= morbus Brightii). The former is anatomically characterised by a degeneration in the tissue of the cortical substance of the brain, destroying the nerve-tubes and nerve-cells. Clinically, it is characterised by a profound alteration in the function of the cortical substance of the brain. The latter is anatomically characterised by a degeneration of the tissue of the kidney, and by alteration in the urinary canals and Malpighian bodies. Clinically, it is characterised by a profound change in the function of the kidneys. In both diseases we observe stages of hyperæmia, increase of volume, degeneration (softening) and atrophy.

In the present state of science we must lay it down that the disease we have been considering consists essentially in *a degenerative process in the adventitious membrane of the vessels of the pia mater, and in the tissue connecting the elements of the cortical substance of the brain* (neuro-glia*), *which degenerative process, in its development, causes the change of the grey cerebral cells into an inert mass.*

When the disease has attained its climax, the use of the animal muscles is completely abolished, and the vital process is deprived of mind—anima—(20).

APPENDIX AND REFERENCES.

1. The disease is thus called in the Asylum for the Insane at Prague. See Fischer, 'Pathol. Anatom. Befunde in Leichen v. Geisteskranken.' Lucern, 1854. This essay contains a review of the pathological changes in 318 bodies of insane patients who died in the asylum between the 18th of April, 1849, and the 30th of June, 1852. The post-mortem examinations were made under Professor Engel's superintendence. The results at which the author arrived are not very decisive.

2. This denomination has been proposed by Dr. Kjellberg, in his 'Clinical Lectures on Diseases of the Mind,' delivered at the Central Hospital, at Upsal, in spring term, 1861.

3. French medical literature of late years abounds in works upon general paralysis. In English there is only one separate work upon the subject, namely, Austin 'On General Paralysis;' London, 1859. In addition, we have papers by Dr. Conolly, in the 'Lancet' for October, 1849; Dr. Skae, in the 'Edinburgh Medical Journal' for April, 1860; and Dr. Harrington Tuke, in the 'Asylum Journal' for October, 1859. Of German authors Dr. Joffe has written best on the subject.

4. Calmeil, 'Traité des Maladies inflammatoires du Cerveau,' tome i, p. 484. Paris, 1859.

5. This term is borrowed from Florman. See his 'Systema Cerebro-Spinale,' p. 71. Lund, 1830.

* γλια=glue.

6. The following classification is chiefly after Brierre-de-Boismont. Compare his paper read before the Academie des Sciences on 24th September, 1860, and reported in the 'Annales Med. Psychol.' 1861, p. 89.

7. "Childish manners contrasting with the habits of the subject. The normal man disappears; it is the child who exhibits himself." (Guislain, 'Leçons Orales,' i, p. 339.)

8. "Every physician who has devoted himself to the study of mental affections has confirmed the fact of the existence of this tendency to theft in individuals labouring under general paralysis. But I have thought it useful to endeavour to make it as publicly known as possible, inasmuch as in courts of justice the presence of general paralysis is often overlooked, not only in its commencement, but even at an advanced period of its development, when there is not merely evident weakness of the intellectual faculties, but even thickness of speech and great difficulty in the articulation of words." (Dr. Sauze, "Observations de Paralytiques condamnés pour vol." 'Annales Med. Psychol,' p. 54. 1861.)

9. See 'General Progressive Cerebral Paralysis, a Chronic Meningitis'—('Die Allgemeine progressive Gehirnlahmung, eine chronische meningitis')—A clinical essay, by Ludwig Meyer. Berlin, 1858.

10. Last autumn I saw in the Asylum for the Insane at Aarhus, a patient at the termination of the third stage of paralytic insanity lying in his bed, and mechanically muttering the following sounds:—"Hjoonn," "Khoonn," forming a bad substitute for the words, million, king (Konge).

11. "Almost invariably the last moments of the life of paralytic patients are attended with convulsions." (Esquirol, 'Maladies mentales,' ii, 264. Paris, 1838.)

12. The fourth stage calls to mind the description of extreme old age given by the Swedish poet Stjernhjelm, in his "Hercules."

13. Morel, in his 'Traité des dégénérescences de l'espèce humaine (1) (Paris, 1857), says, in reference to this point, that since Huss's description of alcoholism, there ought to be no confusion between the latter and general paralysis.—"When medical observation has succeeded in elucidating as happily as the learned Swede has done, one of the departments of science, it is perfectly useless to question the results of works so conscientious. . . . . It is no longer possible for us in the present day to confound chronic alcoholism with other idiopathic affections of the brain and spinal cord. The general progressive paralysis of the insane, when it has reached its ultimate limits, is, perhaps, the only affection, the differential diagnosis of which presents some difficulty" (pp. 79, 94). The knowledge of chronic alcoholism has of late years begun to spread among French physicians, but is still far from being so general as would be desirable and necessary. Conf. "L'alcoolisme considerée à Charenton"

('Annales Med. Psychol.,' p. 565, 1859); and Thomeuf, 'De la Folie alcoolique, Paris, 1859. Erlenmeyer—'The Cerebral Atrophy of Adults' ('Die Gehirnatrophie der Erwachsenen;' Dritte Aufl., Neuwied, 1857)—says in his introduction:—"A condition which might *sometimes* be confounded with it is chronic alcoholism, of which Huss has given so masterly a description." The differential diagnosis between paresifying insanity and chronic alcoholism presents such a great abundance of interesting and, in a purely pathological aspect, important points, that it well deserved to be made the subject of a separate essay. The French writer on paresifying insanity who, in my opinion, is clearest on the difference between the latter and chronic alcoholism is Jules Falret. But he too has "run over the numerous cases contained in the work of Dr. Huss" (Jules Falret, 'Recherches sur la Folie paralytique.' Paris, 1853. Section on "Paralysies alcooliques," pp. 107, *et seq.*)

14. "Sexual excesses have an especial tendency to terminate in general paralysis." (Guislain, 'Leçons Orales,' ii, p. 64.)

15. In Lunier's book, 'Recherches sur la Paralysie générale progressive,' Paris, 1849, most of the cases are either muscular atrophy with paralysis, or chronic alcoholism. Only exceptionally has the author met with a pure case of parseifying insanity.

16. This expression is employed by Lebert ('Praktische Medicin,' ii, p. 440)—λεπτὸς = thin, fine, delicate.

17. In every post-mortem examination of paresifying insanity, I consider it to be indispensably necessary that the cortical substance of the brain should in the first place be the object of a special and careful macroscopic investigation. At the same time microscopic examination ought not to be neglected. Parchappe says on this subject:

"Several times, if I had trusted to simple appearances, and if I had confined myself to the ordinary modes of examination, I might have overlooked the existence of the characteristic alteration. The meninges were healthy; they separated from the surface of the brain without producing that decortication which usually reveals, on the slightest traction, the state of softening of the cortical layer. The surface of the brain was not altered in colour, its consistence appeared to be even increased. The brain, cut into slices, appeared perfectly healthy; but a more accurate examination, and the adoption of a more efficacious mechanical proceeding enabled me, in these cases, to establish positively the softening of the cortical layer in its middle part. The handle of a scalpel, gently insinuated into half the thickness of the layer, succeeded, on cautiously raising the external portion of this layer, in detaching it through an extent greater than that in which the action of the instrument took place, and in this manner I obtained the decortication so easily effected, in the great majority of cases, by simple traction of the membranes.

"The efficacy of this manœuvre in demonstrating the reality of the existence of softening, is exhibited also in ordinary cases where decortication is produced by simple traction of the membranes. It is on a level with the free margin of the convolutions that this result is obtained. But it would be a great mistake to admit in these cases that softening exists only where decortication is produced by traction. Softening of the cortical layer exists also very decidedly in many points of the parts of the convolutions corresponding to the anfractuosities, and of the free margin of the convolutions, whence the membranes are detached without causing decortication. In all these points it is by raising with the handle of the scalpel the external portion of the cortical layer that we can establish on the fullest evidence the existence of softening.

"I believe that the instances of perfect integrity of the cortical layer of the brain in paralytic insanity, which have been adduced, are to be explained either by an error of diagnosis during life, or by the inadequacy of the modes of investigation after death."

The same writer further observes :—"As to the appeal which has been made to the microscope, as the only means of satisfying science upon the question of the seat of the general paralysis of the insane, I believe I may affirm, that for the solution of this question its employment is not indispensable. Doubtless, we may expect from microscopic observations much information and many advantages. I am convinced that microscopy will confirm, and it seems it has already confirmed, the inflammatory nature of the alterations of the cortical layer in the general paralysis of the insane." (Parchappe, 'De la Folie paralytique,' pp. 17, 18. Paris, 1859.) In the estimate of the importance of the microscope with reference to our knowledge of paresifying insanity put forward by the author I cannot participate. The microscope has already proved the necessity for its intervention; without it, science had still remained ignorant of the change in the vessels of the pia mater. Without the microscope nothing would have been known of the excessive formation of the connective tissue of the cortical substance.

18. In this section only the substance of the subject matter has been put forth; all which is not plain matter of demonstrated anatomico-pathological fact is excluded.

19. Delasiauve has anticipated the degenerative nature of the disease; he assumes "un germe détériorant à évolution fatidique" Conf., 'Annal. Med. Psychol., p. 480, 1860. Wedl has demonstrated the degeneration. Calmeil considers that the disease is not of a degenerative nature.

20. I have in this essay employed the word *mind* (*sinne* = anima; sensus intimus) in the same sense as French writers employ the expression "*sens intime.*" Conf. the title to Lordat's book 'De l'Insénéscence du sens intime" (=on the perpetual youth of the mind).

Animus signifies spirit, soul in the higher sense; Ger. Geist. Animus is a spiritual and not a carnal idea. Of disease of the animus or soul we cannot speak in a medical or scientific sense. The circumstances which surround the soul fall within the range of speculative science, and belong not to medicine in the scientific signification of the word.

Personal Identity, and its Morbid Modifications. By J. CRICHTON BROWNE, M.D., Edin., L.R.C.S.E., Ext. Mem., late Senior President Royal Medical Society, Edinburgh; Assistant-Physician, Derby County Asylum.*

THE answer to Shakespeare's question, "What's in a name?" as conveyed in Juliet's subsequent remarks, is, at least in some points of view, unsatisfactory; for placing aside all regard to beauty or euphony of sound, there is yet much either of good or evil connected with every name that rises to our lips or is silently repeated in our minds. There is, to a sensitive being, a pleasure or a pain connected with it, in which memory, experience, and association have wrapped it round. True, the pleasure or the pain may be of infinite and almost imperceptible minuteness, but it is nevertheless an atom in our emotional existence, and is added to the sum of our mental experiences. This is the case with the words used to designate the objects which surround us, but is more obvious with those applied to places which we have visited or known, and to persons whom we have encountered, or with whom we have been familiar. But the importance and significance of a name are most clearly appreciated and understood, when viewed with reference to the articulate sound by which we ourselves are called by our fellow men. This we will find, upon reflection, to be a very important part of ourselves, to be intimately united to our "dear perfection," and to adhere to us with wonderful tenacity, so that it is difficult to throw it aside. At the same time it is well known that a man may be legally stripped of his name, that on a sufficient payment, he may be permitted to denude himself of a beggarly appellation and to clothe himself in one of aristocratic splendour. Yet even after this has been formally accomplished, the savour of his rags will still, we opine, hang about him. The memory of his discarded title will still, ever and anon, come back upon him like vestiges of a state of former existence, and

* I owe an expression of gratitude to Dr. Hitchman for permission to avail myself of the cases in the Derby County Asylum, as illustrations for this paper.