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AMNESIA. COMPONENT FUNCTIONS IN REMEMBERING *

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A discussion of amnesia must involve both physiological and psychological concepts. The functions of which the term amnesia denotes the absence should be conceived as constituting a process for which "remembering" is an appropriate name (since it suggests activity) in preference to "memory," which suggests something passive only. Memory, in this limited sense of a trace which influences subsequent reactions, is something very old in the history of organisms. It is, in fact, characteristic of non-living material and the events of such a simple structure as Bayliss has shown, as a gel.

Remembering, as I use the word here, is an activity of the highest "level" of the organism in Hughlings Jackson's sense, or, in other language, of the "ego." It is, in fact, only to be completely understood in truly psychological terms in the sense advocated by Adolf Meyer. Remembering is not the excitation of innumerable fixed, lifeless, and fragmentary traces. It is an imaginative reconstruction built out of our attitude towards a whole mass of organized past reactions to experience (Bartlett).

Functional Factors in Remembering

In the complete sense of our analysis this activity is a personal act, and depends on the following functional factors, which can be distinguished on the basis of a conjunction of psychological analysis and clinical observation.

REGISTRATION

Defects in this process are not of great interest since they are of a type of failure of attention—for example, from distraction as in acute mania, or of the failure of attention that accompanies any severe psychological disturbance of cortical function, as in febrile delirium. Failure of registration of a different order and of a curiously localized kind may occur in hysterical conditions. The concentric limitation of the visual field is a well-known example, but much that is apparently missed in hysterical subjects is actually registered, as was demonstrated by Morton Prince in his experiments with hypnosis and automatic writing. The failure of the hysteric to attend, and therefore to register, is sometimes grotesque, as in the case of a woman patient who could see everything in the room but myself when she came to the hospital. Such instances can be so gross as to make impossible any symptomatic distinction from malingering. I shall revert later to the conception of hysteria, and its relation to malingering and the bearing of this on the problem of amnesia.

RETENTION

Failure in this on the trace theory of memory would be the most frequent and fundamental factor. But, in

fact, failure in one of the other functional elements must often be mistaken for failure of retention, even in diseases where gross psychological alteration undoubtedly exists. For example, it has been found that a patient who has recovered from Korsakoff's psychosis may recollect events after his recovery that he did not appear to note at the time. Korsakoff himself noted that in some patients events occurring during the time of the illness, which they did not appear to retain at the time, were recollected years after. Bonhoeffer showed in experiments dealing with visual impressions that what was apparently not retained at the time could be recognized later. Grünthal concluded that the apparent failure of retention resulted from difficulty in invocation of engrams—that is, difficulty in recall on account of poverty of associations. I have suggested that it might result more precisely on Bartlett's analysis—failure to extract images. But we must agree with Meggendorfer that there is actually a defect of pure retention in any severe amnesic syndrome of the Korsakoff type.

RECALL

This should be differentiated as denoting two processes of very different complexity: (a) simple mechanical or sensorimotor or "reflex" recall; and (b) recall involving voluntary effort and very often proceeding along associative lines. That recall of this second more complex type should fail before retention fails is to be expected. This type of recall admittedly by definition involves the highest form of mental activity—namely, voluntary effort which is an activity of the ego in contrast to the mechanical or sensorimotor type, which presupposes retention and occurs in accordance with the stimulus response pattern so much studied by the behaviourists. This distinction seems to be confirmed not only by the experience with Korsakoff's psychosis but with the much commoner experience of fatigue or of early senile loss. In both these instances recall, for example, of a proper name may elude the subject's efforts, but recognition is readily possible. It is suggested, therefore, that in the mildest degrees of memory defect—that is, of difficulty in remembering—recall fails first and retention usually later. To regard the process of voluntary recall as a high-level function is also in accord with the data of psychogenic amnesia, which appear to be concerned almost exclusively with interference with the process of recall.

Epilepsy, when psychological rather than (as yet) demonstrable structural disease is its basis, also furnishes examples of a failure of recall which gives the appearance of retention defect. It has been found by McCurdy in epileptic demented that with effort, if the patient can be induced to make it, his capacity for remembering is much greater than formal tests would at first lead one to suppose. Nevertheless retention is a function very sus-

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ceptible to interference. I have seen retention defect as a very early symptom of brain tumour. Capacity to remember a short series of digits was lacking immediately after they had been given to the patient; there was no apparent recognition when they were re-presented. Similarly in anaesthesia, when the patient is mildly under the influence of the anaesthetic but not yet stuporous, and is still able to carry on a conversation, showing that registration and presumably some immediate retention occurs, there may be no subsequent remembering or recognition when the facts are afterwards described to the patient. Even here, however, the presumption that it is retention rather than recall that is effected by physical factors may be too readily made, as is illustrated by a remarkable case in which recovery occurred under hypnosis from a traumatically produced amnesia, related to me by Dr. I. G. Robin. The patient was under the care of Dr. Hurst at Guy's Hospital. Here, if the facts are accepted as complete—and nothing has emerged to suggest that it had been a psychogenic amnesia—a brain trauma produced a failure of memory which masqueraded as a defect of retention. Retention was in fact unimpaired, as was proved by the recovery of details under hypnosis, which apparently somehow inhibited what was actually an inhibition of recall. Furthermore, we have the interesting spectacle of a psychological process reversing a physically induced inhibition.

A possible explanation, of a sort, of the way in which recall may fail, as it did in this case, is suggested by what happens in aphasic disorders, when the patient seems to know what he wants but gets side-tracked, as it were, and produces, to his annoyance, the wrong words. Grünthal has suggested something analogous to this as the reason for the apparent memory defect in Korsakoff's psychosis. He believes that the Korsakoff patient has lost the power of directing his thoughts, so that any attempt at recall comes to an end abruptly. The train of thought goes off on its own, so to speak, with the result that confabulation occurs, as nothing more than the result of the process of voluntary recall getting side-tracked. In the Hurst-Robin case voluntary effort at recall was possible, but the effort was side-tracked or was held up till hypnosis removed the inhibition.

TIME-ORDERING OF EXPERIENCE

It is held that one of the primary mental functions is to infuse experience with a time sense. This private time is of course different from conventional time, and has no direct connexion with it. Its fundamental characteristic is a sense of time, not as a simple appreciation of duration, but of something that continuously elapses. It is difficult to disentangle the conceptual superaddition from what is probably an elementary experience. It gives a background for other experiences, and so secondarily comes to be responsible for sequences. There is, in fact, a primary time-ordering of experience, independent more or less of associated processes. The pictures stamp themselves on the unrolling time-film independently of their content.

On the basis of such a conception Van der Horst has advanced an ingenious explanation of the Korsakoff patient's failure to remember. He suggests that in Korsakoff's psychosis the memory defect is not the result of failure of immediate reproduction (which he declares to be often unimpaired), but of the loss of the "temporal sign" of experiences. For example, one of his patients when given a cigar and asked about it a quarter of an hour later, replied: "I have had a cigar, but it was last week." In Van der Horst's view the temporal sign of a personal event depends on the time order of experience

in the continuum of one's individual life, and in Korsakoff's psychosis this continuity of experience is no longer felt. In answer to the question "How long have we been talking?" the Korsakoff patient answers either "a quarter of an hour" or "two hours," although he may remember the entire content of the conversation quite well. Van der Horst considers that if time order is lost for current experiences the feeling for the need of it in regard to past experiences will soon be lost also. Hence, also, the retrograde amnesia of Korsakoff's psychosis.

"PASTNESS"

I suggest that there exists as an independent function a feeling of pastness, the existence of which may be demonstrated from two kinds of experience: the *déjà vu* feeling of some epileptic attacks; and such an experience as that of a patient of mine who felt each time she underwent an experience that she had a dream, and that the dream, although not recollected, was the same as she had had on the previous occasion. The feeling of recapitulation of something that had happened previously was very distinct and independent apparently of the content, or at least of any conscious recollection of it. The feeling of pastness seems therefore a distinct and isolatable experience; it seems likely that loss of the capacity for it could have an effect on the total experience of remembering.

PERSONAL IDENTITY

Cases of massive amnesia which include all personal data are not very uncommon. The patient professes amnesia not only for the events of his previous life but for all personal data as well, including even his own name. Nevertheless, as a rule, the automatized functions, such as the educated use of words, are completely retained. Commonly also the social habits of an adult are also retained. In a few cases called "hysterical puerilism" learned habitual reactions of all kinds are also lost.

Another case presented some unusual features. The loss of personal memory had persisted for three years, and a localized personal memory for three years only had been built up, while all the previous data for the first forty years of life had disappeared. Under mild narcosis the patient re-enacted a war scene in which he identified those around him as fellow soldiers. Subsequently on gradual emergence from the narcosis he recollected all his previous life. (H. Campbell.)

It looks like the reverse process to that of the Hurst-Robin case, where a psychological process (hypnosis) undid a physically produced inhibition of recall. Here, in Dr. Campbell's case, is a physiological process (narcosis) undoing a presumably psychologically produced inhibition.

Such cases do not, however, demonstrate the existence of a discrete factor for personal identity, apart from recollection of events, as a component in the total process of remembering. For more conclusive and not merely suggestive evidence of the existence of such a factor we have to go to cases of depersonalization, where, although there is no forgetfulness, the recollected events lack the emotion of belief because they seem to belong to another existence or even to a different person.

A sense of personal identity is therefore evidently not essential to mere recollection, but it is evidently a distinct function, not emergent simply from the aggregation of other elements. It is a part of the complete experience of remembering, when the latter is considered in the full sense of the function of the highest level of the integrated healthy organisms. Schilder and Abeles record cases of amnesia (with loss of personal identity) in a wide variety of syndromes—for example, in a schizophrenic

psychosis—a manic-depressive psychosis in various organic brain diseases (head trauma, arteriosclerosis, and carbon monoxide poison), and in malingering.

Factors in Remembering	Conditions in which these functions are interfered with or appear in isolation
(1) Registration	Acute organic reaction type (delirium); manic excitement (inattention); hysteria (global inattention)
(2) Retention	Organic reaction type in general
(3) Recall	1. Simple and elementary (reflex) organic reaction type (severe degree) 2. As a voluntary act; psychogenic conditions (various, for example, hysteria) Certain forms of organic reaction type (for example, head trauma, Korsakoff's psychosis, epilepsy)
(4) Time sense	Various psychoses with depersonalization; possibly in Korsakoff's psychosis (amnesic symptom-compl. x)
(5) "Pastness"	Epilepsy (<i>déjà vu</i>), and anaesthetic states
(6) Associations	In schemata determined by sense organs } Organic reaction types in general; psychogenic conditions appetite } instincts } interests }
(7) Imagery ("extracted" images of Bartlett)	Korsakoff's psychosis; early senile dementia
(8) Personal identity (awareness of)	Hysteria; depersonalization in various psychoses

Psychological Factors in Amnesia

The processes (assuming registration and retention) involved in the inhibition of remembering—that is, in producing amnesia—must necessarily be concerned mainly with the inhibition of recall. Recall, as has been suggested above, may be side-tracked for physiological reasons, or it may be apparently blocked as in epileptic dementia. But the commonest mode of inhibition of recall is certainly psychological, the processes being known as repression. It has always been difficult to know precisely how repression occurs. Freud first demonstrated the importance of the process of active forgetting, but he was not descriptively precise. He described the process in a figurative way: In repression "the impulse retains its energy but no memory is left behind." This is accomplished "without the cognizance of the ego, by the 'doorkeeper' or 'censorship.'" The main evidence for the occurrence and persistence of repression comes from the resistances encountered in analysis. The process is an all-important one. "All symptoms," states Freud, "depend on repression." Repression always produces amnesia for something. "All symptoms," he says, "have a related amnesia."

I suggest that all amnesias are not due to simple fading or to active forgetting (repression). There are other possible sources of amnesia for experiences that are still retained somehow. Early mental events take place proportionately more often, for example, in visual terms—according to the evidence of recollection in psychological analysis. More importantly, the schemata of early infantile and childhood years are different from those of a later age. A breast is not remembered as such but as a large globular object, with perhaps softness and satisfaction associated. The process of repression itself is equated by Fenichel with inhibition. "Inhibition and repression are two aspects of one and the same psychological process," he writes; in other terms, they are different words for the same thing. It is agreed that repression is not a voluntary act.

Amnesia from repression may depend on one of three processes. There is an automatic operation of the super-ego, as in some neuroses which have their origin in earlier life. There is the operation of the ego itself. It

appears that any experience with an emotional content such as to threaten self-preservation or some very valued function, such as seeing, may be unendurable, and the ego appears to protect itself by repressing the memory of the experience—that is, by failure to remember it. An example of this type of forgetting was furnished by a youthful murderer who, after recounting all the incidents of the murder, forgot the whole episode, including his own story about it, although he did not seek to escape responsibility but rather to shield his accomplice. It is this type of forgetting that some critics of the psycho-analytic theory of repression have exclusively attended to when they have asked the question, with its consequent answer: Are painful experiences really more apt to be forgotten than pleasurable ones? Wohlgemuth, for example, answered this question in the negative as the result of a questionnaire. But it is the quality of the pain and its association that are important. How is it painful, and why? Painfulness reaching the intensity that seems to threaten existence must be rare, hence type 2 is likely to be uncommon. But amnesia of type 1 depends for its occurrence on the quality of shamefulness, not of simple pain. Moreover, such a questionnaire as Wohlgemuth's ignores the important finding that it is not so often facts as fantasies that are forgotten by this method.

A third type of amnesia is the commonest in everyday life. It is the type which is based on the conflict of wishes, as, for example, in the forgetting of an appointment, where a kind of reciprocal inhibition is possible, and that wish usually wins which is more in accord with the egotistical interests.

Clinical Types

Clinical types of amnesia may be differentiated purely descriptively as (1) fragmentary, (2) localized or insular, and (3) total, and each of them may be retrograde or anterograde. By fragmentary I mean to denote the amnesia of progressive brain disease—for example, in senile dementia—where details of experience are forgotten long before the anterograde amnesia becomes generalized on the whole advancing front of what should be daily experience. This kind of amnesia does not depend so entirely on retention defect as is usually supposed, as the foregoing analysis may have shown. Interest and appetite, as well as the ability to schematize and extract, may all play a part before any associative or primary retention defects on a basis of neurotic decay sets in.

The insular and total amnesias are of chief clinical interest, both from the standpoint of differential diagnosis and for medico-legal reasons. The causal factors may be classified as: psychogenic—affective, hysterical, and simulated; and physiogenic—traumatic, etc. I have purposely distinguished an affective type of amnesia from a hysterical one. I believe it should be remembered that hysteria is a very distinct conception; the term should not be applied loosely to any gross disturbance of function which is evidently psychogenic. This is a frequent error. Affective amnesia occurs in accordance with the process described in type 2 above. For example, if an individual goes through the experience of an earthquake, and is subsequently found to be amnesic, I should classify his amnesia as affective. It would depend entirely on the emotional shock, and would be without discoverable motives other than to protect consciousness from painful memories.

Hysterical amnesia, properly so called, involves something very different from this. It means: (1) A concept of forgetfulness as a symptom, just as a patient may have a concept of paralysis or of anaesthesia. He would persuade himself and the onlookers that he could not remember, and this failure of memory would follow

certain lines, just as the anaesthesia would belong to the glove, or stocking, or mid-line patterns. Hence the particular characteristics of his amnesia would depend first on what he had heard or read, and secondly on the method by which he was examined. (2) Hysterical amnesia has a motive, but this may sometimes be far to seek, since it often depends on inner difficulties.

The third type of psychogenic amnesia, that due to simulation, is extremely difficult to differentiate clinically from hysterical amnesia. The reason for the difficulty is simple. Hysteria and simulation are the same thing from the symptomatic standpoint, but the reasons for their recurrence are of a vastly different order. In hysteria the patient simulates from inner needs. He knows he is simulating, but he does not know why, except that he may realize he wants sympathy. In simulation the patient does it to evade crude external difficulties of a contemporary kind of which he is perfectly aware. The inner needs of the hysteric, on the other hand, are narcissistic and infantile. His narcissism gives him a tendency to self-display which readily utilizes dramatic possibilities. I suggest that all the grosser symptomatic manifestations of hysteria are the joint manufacture of the patient and the too credulous physician, and that the study of these gross symptoms has only served to obscure understanding of the underlying mental constitution.

An examination of the earlier history of adult hysterical patients tends to support this view. In a study of the so-called pre-morbid type of personality twenty-four patients who subsequently developed a gross hysterical reaction had been, by comparison with thirty-seven who developed a psychoneurotic anxiety state, as a rule much less energetic and in fact often sluggish and lazy. They had not only been shy and reserved, but apt to be negativistic, stubborn, counter-suggestible, and readily antagonized. But the most pronounced differences between them and those who displayed symptoms of the psychoneurotic anxiety type was the frequency with which the hysterics had exhibited anti-social reactions of a more pronounced variety, ranging from the holding of strong revolutionary political views with an obvious self-interest to a frankly persecuted attitude to society and even actual delinquency. Other characteristics of this type were inebriety, bad temper, untruthfulness, persistent quarrelling with the family, and a general lack of conscientiousness and of any sense of social responsibility.

The concept I am putting forward would correspond with the observation that multiple personalities are not apparently observed nowadays, nor are the phenomena observed by Charcot. Both of these facts support the contention that the gross symptomatic manifestations are artefacts, just as much as dermatitis can be when it occurs in such persons. It is true that after a time the patient may himself come to believe in the amnesia. As a patient of mine once said: "There is a moment of conscious acceptance of the neurosis." After that the patient believes more or less in his amnesia until someone with a strong conviction to the contrary persuades him to look again towards the memories from which he is turning away.

If hysterical and malingered amnesias are both consciously simulated, the former at least at first, they follow the patient's concept of what amnesia should be in both instances, and there will be no distinction between the two types. Any difference between hysterical and malingered amnesia will be individual, depending on the patient's experience, and not differing in any general way in its characteristics as between hysteria on the one hand and malingering on the other. I should regard as

almost certainly malingered an amnesia arising without physical cause in a patient who is up against a well-known material difficulty—for example, an accusation of embezzlement.

Organic and Psychogenic Amnesia

The differential diagnosis between an organic and a psychogenic amnesia depends on the following.

1. The nature of the discoverable aetiological factor, whether it is of a psychological or a physical kind.

2. The type of the amnesia itself: (a) if it is associated with complete intellectual capacity from the beginning of the time it comes under observation it is psychogenic; (b) if it is arbitrarily selective, inconvenient events being forgotten, it is certainly psychogenic. For example, a woman accused of shoplifting remembered all the big stores she had visited that afternoon, but did not remember purloining anything.

3. The type of recovery: (a) if this is sudden and complete it is probably psychogenic; but (b) if it occurs by a gradual rolling up of the amnesia in an orderly fashion it is probably physiogenic.

4. The extent of the amnesia, so far as those of acute onset, at any rate, are concerned. It has been observed by Ritchie Russell that the longest period for which the patient has subsequently a retrograde amnesia, when this occurs from a physical cause—for example, trauma to the head—has been seven days. Anything longer than that in the way of amnesia or sudden onset suggests a psychological origin.

It is perhaps not so well known that a post-epileptic amnesia may extend in a retrograde fashion far preceding in time the onset of any apparent epileptic state. I saw a patient recently who, after a major fit, forgot all the incidents of the previous week, when she had been carrying on her duties perfectly well as a school teacher. But a much more striking case has been reported by Stenman, who quotes five other patients who were mentally alert and intact during the space of time for which there was subsequent amnesia. In Strümpell's case the attacks left a loss of memory for the preceding three months which was never recovered.

It is important to contrast this with instances in which definite disorder of consciousness exists, which is not apparent to the onlooker, for a period during which the patient has subsequently an amnesia but during which he may perform very complicated actions. It is sometimes disputed in a court of law whether complicated activity of the type which would pass as normal to the onlooker is possible during a state of disordered consciousness following a head injury. It is very interesting to quote the experience of C. E. Winterstein and Guttman, who have recently been investigating at Guy's Hospital the psychological and neurological state of professional boxers. They have collected a number of instances of amnesia in boxers following a knock-out. Some have remembered the sensations in the body after the punch. Others cannot remember having felt the punch but remember having seen it. Others do not remember anything of the punch. In these cases the knock-out was complete, and the boxer remained inactive until, after a short time, memory came back gradually.

There is a second group of patients in whom the amnesia extends in retrograde fashion from the time unconsciousness became complete. During the time which elapses between the receiving of the blow and the ultimate unconsciousness the boxer is apparently capable of behaving as if he were fully conscious. Cases are on record of boxers who have been allowed to fight on and who have, in some instances, won the fight. A heavy punch has been received earlier in the proceedings, but the boxer had no memory at all of the fight from the time when the punch was received.

There is one well-known boxer who, when 15 years old, was caught by a punch on the chin in the first round of a fight. He went down for a short count, but regained his memory under a cold shower. He had to find out carefully what had happened. He heard that he had fought like a tiger and won through a technical knock-out in the third round. Since the fight was won ultimately there would be—as Winterstein and Guttman point out—no motive for forgetting it.

The automatic activity of epilepsy with subsequent amnesia is celebrated, and is commonly reputed to be capable of reaching a high level, although the activity that takes place is held to be marked by impulsiveness and by lack of apparent purpose. This, if true, contrasts with the cases of boxers who proceed to win their fight—that is, they display a high degree of purposive activity while in a state of disturbed consciousness following the

blow which ultimately produced amnesia. The importance of this observation suggests that in epilepsy also there may be purposive activity relating to the ordinary life, and that purposelessness is not an essential and indispensable mark of an act of automatism.

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CIRSOID ANEURYSM OF THE SCALP

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A study of textbooks shows that unanimity of opinion as regards the classification of scalp aneurysms has not yet been reached, while the aetiology of certain of these aneurysms has not definitely been settled. In a textbook published in 1900 the following statement appears:

"Aneurysms of the scalp—that is, cylindrical, spindle-shaped, or sacculated dilatations of arteries—are most common in the region of the temporal artery after injury of the same by a cut, stab, or contusion. These traumatic aneurysms result from a gradual yielding of the thrombus formed on the inner wall of the vessel at the seat of injury, and of the surrounding loose connective tissue from the impulse of the blood wave until finally a sac is formed, the wall of which consists of the outermost layers of the thrombus, the surrounding soft parts, and the newly formed connective tissue. In the case of non-traumatic or true aneurysms the artery gradually increases in circumference as a result of chronic endarteritis, which weakens the walls of the vessel to such an extent that they gradually yield to the blood pressure. In case the artery and corresponding vein are wounded simultaneously, an arterio-venous aneurysm may result—that is, a communication between the artery and vein is established, in some cases through an intervening sac. Owing to the communication between the artery and vein, marked disturbances in the circulation result, with pulsating dilatations of the arterial and venous branches. Almost all arterio-venous aneurysms result from injuries. Bramann states that among 159 cases there were only nine which began spontaneously. When spontaneous, there is at first a gradual dilatation of the artery from chronic endarteritis; the dilated sac then becomes adherent to the vein, and finally the aneurysm breaks through either into the open or already obliterated vein.

"Another form of aneurysm is the cirroid aneurysm, in which a number of arteries and their capillaries become dilated, tortuous, and thickened. It usually develops from abnormal congenital conditions, and should really be classed among tumours. Less frequently it is acquired. At one time a distinction was made between cirroid aneurysm and anastomotic aneurysm, the former being a diffuse dilatation of already existing arterial branches, with perhaps their capillaries and veins, while the latter was looked upon more as a tumour resulting from the new formation of dilated and elongated arterial branches. But these two forms frequently have transition stages, so that a discrimination cannot be made between them. The region of the ear and temples is a favourite place for cirroid aneurysm. It seems to be common in women, in whom a tardy commencement of menstruation and frequent pregnancies are predisposing factors. The differential diagnosis between a cirroid and an arterio-venous aneurysm is sometimes difficult."

The older surgeons had great experience in the diagnosis of aneurysm, but I should imagine that even to them "the differential diagnosis between a cirroid and an arterio-venous aneurysm" must have been "somewhat difficult." In a textbook published in 1923³ we read as follows:

"Plexiform angioma—this rare form of angioma was formerly known by the names 'cirroid aneurysm' and 'aneurysm by anastomosis.' Although the vessels composing it are chiefly arterial, the veins and capillaries of the part may also partake in the production of the tumour, and thus the name 'arterial angioma,' which is sometimes applied to it, is not strictly accurate. The disease is most common in the scalp, especially in the distribution of the temporal and occipital arteries, and in the external ear. It consists of a mass of large, tortuous, intercommunicating, pulsating vessels, sometimes forming a mixed tumour extending over a considerable area. At the peripheral parts of the mass the normal arterial trunks are much enlarged, and can be traced into it. Accompanying the pulsation a loud bruit may be audible to the patient as well as to the observer. The whole tumour has a convoluted surface and a bluish colour; the overlying skin may also be naevoid, and in the scalp generally becomes hairless.

"Plexiform angioma usually develops gradually in young adults; it probably originates in a congenital naevus through an exaggerated formation of the enlarged and convoluted arterioles that sometimes form part of such a naevus. In other cases the disease has followed an injury."

This gives the impression that cirroid aneurysm is usually a congenital condition. Yet in 1906¹⁰ Berry had written: "It is well known that cirroid aneurysm commonly develops after injury. It seems reasonable to believe that an injury involving both artery and vein would readily allow arterial blood to be transmitted to the interior of the vein. The increased pressure would naturally cause distension of the thin-walled veins, and a tumour composed of dilated and tortuous veins would be formed." Florence Sabin in 1913 showed, on the other hand, that the development of the capillary field afforded opportunities for communications between arterioles and venules to persist.

A study of the more modern textbooks and periodicals available in this Colony leave one with the impression that the elaborate classifications mentioned or outlined must be extremely confusing to the student. The subject is admirably summarized by Henry Searby⁶ in the *Australian and New Zealand Journal of Surgery* (1931, i, No. 2). He writes:

"There thus appears to be considerable evidence that cirroid aneurysm, racemose aneurysm, aneurysm by anastomosis, and pulsating angioma should be regarded as due to the same cause as arterio-venous aneurysm—that is, an abnormal communication between the arterial and venous systems—and, further, that such abnormal communication may be