A Study of Stupor.

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The manifestation of vital activity demands the consumption of material, and the diminution or absence of this material, of a necessity, and proportionately, compels the diminution of absence of the power of manifestation of vital activity. Take, for instance, the comparatively crude example of starvation.

In general malnutrition the nervous system certainly suffers, not so much, however, in the direction of its simple vegetative existence as in the capability of manifestation of its functional activity. That the nervous system should suffer in general malnutrition is highly rational, considering that in the case of the encephalon the blood supply is so markedly against gravity, and in the case of the spinal cord, as pointed out by Dr. Moxon,* there are sufficient anatomical reasons to suggest a difficulty in carrying on the circulation even in healthy persons. The earlier mental symptoms of starvation are naturally those psychical conditions brought about by the abdominal pain, invariably present in these cases, then follows some mental lethargy and stupor, interrupted, it may be, by attacks of almost maniacal excitement, proceeding to a gradually increasing stupor and torpidity, the mental faculties becoming steadily obscured in proportion to the failure of bodily nutrition. This, then, is a clinical picture of an acute malnutritional neurosis which may be looked upon almost as an experimental insanity, inasmuch as by a definite interference with the usual course of nature a definite mental sequence has occurred. It is then only fair to conclude that the symptoms enumerated have for their basis a want of food supply to the nervous system which leads to the condition called "irritable weakness," at first sight simulating hyper-activity, and from this proceeding to a gradually increasing stupor which ends in death.

Now this picture of an acute malnutrition is a type of what occurs daily in a certain class of cases, namely, the large group of mental diseases which have it for their basis, though not perhaps solely due to malnutrition—a series which includes phthisical insanity, the more common forms of post-febrile

* "Croonian Lectures on Influence of Circulation on the Nervous System," "Lancet," April, 1881.

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insanity, lactational and post-lactational insanity, and many others.

But the term malnutrition, in its wider sense, applies to the result of a deficient supply of any of the animal food requirements, and therefore there may be a dystrophoneurosis arising from not only abnormal conditions of the digestive process and absorptive mechanism, but also from certain pulmonary cardio-vascular and other conditions. That is to say, theoretically, a dystrophoneurosis may arise from an interference with the supply or transmission of food on the one hand, and the molecular condition or trophic energy of the tissue on the other.

The leading symptoms, then, of these nutritional forms of insanity are the expression of a badly-nourished and exhausted brain. It may be that the blood is insufficiently oxygenized, or that its nutritive value is diminished in other ways, more frequently, perhaps, to both conditions in a varying degree, or, again, it may be that the actual amount of blood reaching the nervous system is deficient. And it is in just these cases that marked mental improvement occurs in the hyperæmia of an incipient eruptive fever, or the febrile condition coincident with an acute attack of some intercurrent disease, a change strictly comparable to the improvement which takes place in a semi-comatose fever patient when immersed in cold water, or the improvement which takes place in the insane delirium of some heart cases by placing the head low, as suggested by Dr. Moxon, * or to the markedly beneficial result of the postural treatment of syncope. In all these cases the improvement is evident, and, doubtless, is due to the removal of the immediate, though not the remote, causative condition, namely, the anæmia of the brain.

It is evident, then, that if a series of mental diseases are to be classed under the collective title of "dystrophoneurosis," and the word malnutrition, which is the key-note of the division, be employed in its wider sense, that the group must necessarily be a large one, the mere enumeration of whose members would require considerable care. We will then select one member of the group for investigation in greater detail, namely, the peculiar form of mental disease termed acute dementia by Esquirol,† stupor, stupemania, stupidité by

* *Op. cit.*

† French alienists have now quite discarded this term as misleading in regard to the pathology of this state. See paper in the "Transactions of the International Medical Congress," 1881, on "Mental Stupor," by Dr. Hack Tuke, who

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other writers, psycho-coma by Clouston, * and anergic stupor by Hayes Newington. † Excluding, however, from this heading the condition which has been called, though not differentially, mélancolie avec stupeur by Baillarger, and melancholia attonita by other authors, because, though these two conditions have many points of resemblance, they have also, in general, a sufficient number of points of difference to allow of a differential diagnosis being made during life. The following may be taken as a fairly typical case, selected at random from a series of cases under observation, the enumeration of the points of which will serve the purpose of a definition of the class of cases referred to under the head of stupor.

M. W., æt. 21, a girl, admitted to the asylum on certificates which indicated that she was dull, stupid, and refused to give any proper answer to simple questions, was very quarrelsome, and spoke to parents in an improper manner, refused to attend to her own personal cleanliness, and was sometimes destructive.

Her father says she has been a mill worker, and has "tried to master her work, but had never done so properly, and has worried about it." She has never had any fright or serious illness, nor been intemperate as regards alcohol, and as far as he knows she has led a moral life. No history of phthisis or epilepsy. Mother's uncle in an asylum.

Patient was a fairly well-built and nourished girl, of light complexion and grey eyes. She had a dull, stupid appearance and manner, and when spoken to looked at her questioner without answering, and when told to do anything, only did it with a good deal of urging. When questioned she is sullen, sometimes, however, laughing a little to herself. Later she became irritable when interfered with, and sometimes became violent. She usually sat still all day in the same position doing nothing, the saliva dribbling from her mouth, and her extremities blue and cold. She became altogether dirty in her habits, and required feeding, washing, and dressing, until gradually she developed phthisis and died.

This, then, is a picture of the so-called "acute dementia,"—a history of more or less distant or indirect heredity, if any, a mental or moral strain, possibly not greater than usual, about the period of adolescence, and then follow the mental symptoms with their physical expression, and earliest, almost invariably, is a period of irritability, manifested by quarrelsomeness

has given the results of a series of cases in which the mental condition present during the attack was ascertained after recovery. These cases prove that in a large number of cases in which the mind appeared to have been a complete blank, and the diagnosis of so-called "Acute dementia" had been made, the patient was in reality the victim of a terrible and overpowering delusion.

* "Clinical Lectures on Mental Diseases," 1883, p. 287.

† *Ibid.*, and "Journ. Ment. Sci.," Oct., 1874.

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and intolerance, the almost invariable mental symptoms of a badly-nourished brain, and later come lethargy and stupor, with attacks, it may be, of almost maniacal violence if interfered with, proceeding to a gradually-increasing torpidity, till death takes place, or a return journey is made by the same stages to recovery. It cannot be denied that the course of the mental symptoms closely resembles that produced by simple starvation, though naturally differing in numerous details. Be that as it may, this typical form of stupor is manifestly a nervous system not working sufficiently, when it is taken into consideration that the age at which it usually occurs is that at which the mental, bodily, and sexual activities are very prominent normally, and it seems fair to assume, from the analogical argument, that the insufficient working may be due to insufficient food material. There are, however, other arguments which occur to suggest this reason for the condition. As previously mentioned, in the febrile condition there is almost invariably some mental improvement in these cases; for instance, many of them die of phthisis, and in most, when the pulmonary lesion is advancing rapidly, the temperature correspondingly raised, as it commonly is, and the circulation quickened, a certain appreciable degree of brightening takes place. More markedly, however, is this the case if pneumonia be the intercurrent disease. Again, there are undoubtedly many cases amongst them which are benefited by various nitrites, administered internally or by inhalation—chemical agents, whose main action * is to dilate the arterioles and quicken the circulation, the brightening effect, however, being only transitory, as the action of the drug also is. Again, Dr. Riva † has described a case of intermittent lypemania which was improved by transfusion, a mode of treatment which, being of at least temporary service in all conditions of anæmia, would suggest malnutrition of the brain as a cause of this state. The effect of suddenly applied cold water on these cases is also an argument in favour of this view, in that the cutaneous vascular areas being constricted, the temperature is slightly raised, respiration and circulation quickened, and the supply of blood to the brain is thus rendered more efficient. There is, in addition, some experimental evidence which may be adduced to show that the effect of diminished blood supply to the brain is such as is present in the condition of stupor. Victor Horsley and Walter Spencer, ‡ in a series of experi-

* "Pharmacology," "Therapeutics and Materia Medica," T. Lauder Brunton.
† "Rivista sperimentale di Freniatria e di Medicina Legale," 1877.
‡ Scientific Grants Committee Report, "Brit. Med. Journ.," March, 1889.

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ments have recently demonstrated that the stimulus necessary to evoke a motor response in a cortex normally supplied with blood must be increased if the blood supply be diminished, the stimulus and the blood supply thus standing practically in an inverse ratio. This is an exactly analogous condition to that which occurs in stupor, for instance. Simple speaking to a patient in this state frequently produces no result, a stimulus which in the healthy brain condition does so, but if in addition the patient be taken by the shoulder and shaken, or the interrupted current be applied, a result most frequently is produced, this additional stimulus being analogous to the experimental approximation of the secondary spiral of a Du Bois Reymonds induction coil. Again, the effect of food on these cases is sufficiently marked to call attention to the fact that the mental and bodily conditions improve step by step—it may almost be said pound by pound, since at a certain stage the loss or gain of three or four pounds produces a definite and corresponding change in the mental condition.

Assuming, then, that the condition called "acute dementia" is due to a chronic malnutrition of the brain, the proximate cause of this malnutrition becomes the next question. Now the blood vessels, as usual, have received their share of attention on this subject—Etoc Demazy* having long ago considered that it was due to a passive congestion of the brain, followed by an infiltration of serum into the hemispheres, by which the convolutions were subjected to pressure from within, and consequently flattened against the cranium. A somewhat similar opinion was also held by Dr. Scipion Pinel. Others, however, including Dr. H. Mabille, oppose this view. Dr. Crichton-Browne † suggests a "state of the vessels allied to chilblains, a condition of atony ‡ of the intracranial vessels." Dr. Luys § considers, on the other hand, that the condition is often the result of vaso-motor spasm, by which the nervous elements are deprived of their proper supply of blood; and Dr. Tèbaldi evidently assumes this condition, since he uses amyl-nitrite to dilate the peripheral arterioles with undoubtedly good, though temporary, effect in certain cases.

Now, given a certain cranial capacity, and a normally proportionate encephalic mass, it is certain that an equally definite relative amount of blood must also be contained within the cranium to supply nutritive material in sufficient quantity

* "De la stupidité considérée chez les aliénés," Paris, 1835.

† West Riding Reports, Vol. iv., 281.

‡ The mistake, however, must not be made of confounding "*atony*" with "*attonita*," which owns a totally different etymology.

§ "Leçons cliniques sur les maladies mentales," Paris, 1883, 176.

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for the use of the vast protoplasmic laboratories of the grey matter; if this blood fall short in quantity, imperfect nutrition of the brain, a degree of starvation, and consequent imperfect action must necessarily ensue. Moreover, though the proportionate volumes of encephalic blood do not undergo a relative diminution, still, variations in cerebral function can be induced by altering the constituents of the blood in various ways, by introducing into it such bodies as morphia, cannabin, picrotoxin, alcohol, certain leucomaines, and other substances, by diminishing its nutritive quality or degree of oxygenation, seen in many diseases, or by increasing or diminishing the rapidity of its flow.

The volume of the encephalic blood may be diminished by anything which lessens the absolute quantity of blood in the body as a whole, such as bleeding, or its relative quantity as in shock, by a variety of bodily conditions, such as cardiac derangements interfering with its propulsion, or by diminution of the calibre of the vessels. In Table I., on page 366, is shown a list of diameters of basal vessels (two carotids and basilar only), being portion of a series collected for other purposes, and taken quite at random as regards mental condition. The measurements were made by means of a series of gun-metal cones, and the point where complete extension without distension occurred was regarded as the normal diameter of the vessel.

In certain of these cases the cause of the change is very obvious in the occurrence of atheroma, which causes a decided though not great diminution, or in the syphilitic cases, especially 14 and 18; in the former, the lower of the two measurements was taken in the cavernous sinus, and demonstrates a dilatation secondary to weakening of the wall by syphilitic arteritis, and in the latter case a tendency to occlusion is marked. The other cases in the list which show any marked diminution of calibre are all cases of marked stupor, No. 4 being a very marked case in which this stenotic condition was present. In No. 6, again, there was a further complication in the form of a tumour of the falx cerebri, of considerable size, invading the internal surface of both hemispheres, but no history of the previous mental condition of the patient was obtainable. Nos. 4, 9, 13, and 19 were practically pure cases of stupor, though in the last were points of special interest, to be referred to later.

That this stenotic condition of the arterial system of the brain must have considerable effect seems evident from the following table, in which the corresponding cubic capacity of a tube one ctm. long, and having these various diameters, is shown,

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TABLE I.

	Name.	Sex.	Age	Mental condition.	R. Cd.	L. Cd.	Bas.	Remarks.
1	A. C.	M.	62	Senile melancholia	4	3	3	
2	W. H.	M.	22	Mania	3·5	3·5	2·5	
3	D. W.	M.	62	Senile dementia	4	4	—	
4	C. F.	F.	38	Stupor	1·5	2	2	
5	J. L.	M.	47	General paralysis	3	3	—	
6	C. K.	F.	27	Epilepsy, stupor, and dementia	2·5	2·5	—	Tumour of dura, involving brain substance. No history obtainable.
7	G. T.	M.	40	Resistive melancholia	3	3	—	
8	A. M.	F.	60	Chronic melancholia	3·5	3·5	—	
9	S. P.	F.	19	Stupor	1·75	2	2	Aorta and all vessels very small, and, in addition, mitral stenosis.
10	H. H.	F.	18	Imbecile	3	2·5	1	
11	W. B.	M.	65	Melancholia & dementia	3·5	3·5	5	
12	B. W.	M.	38	General paralysis	3	4	3	
13	M. B.	F.	23	Stupor	2·25	2	1·75	Vessels throughout body of small calibre.
14	W. S.	M.	60	Dementia (syphilis)	$\frac{4·5}{6}$	5	2·5	Syphilitic case ascertained.
15	M. R.	F.	21	Epileptic	3·5	4	2·5	
16	J. D.	M.	68	Senile dementia	3·5	3·5	—	
17	P. C.	M.	42	General paralysis	3	3	3	
18	M. W.	F.	40	General paralysis	2·75	3·5	2	Syphilitic ascertained.
19	B. M.	F.	25	Stupor	2·5	2·5	2·5	
20	A. A.	F.	40	General paralysis	3·5	3·5	3·5	
21	M. T.	F.	27	Imbecile	3	3	2·25	
22	C. W.	F.	40	General paralysis	3	3·5	3	
23	M. C.	F.	39	Epileptic	3	2·8	2·5	
24	E. O.	F.	45	Imbecile	2·8	3·5	2·25	
25	H. E.	F.	53	General paralysis	3	3·5	2·5	
26	M. E. K.	F.	36	General paralysis	3·5	3·5	4	
27	S. W.	F.	59	Dementia	4	3·5	3·25	
28	G. G.	M.	42	General paralysis	4	5	3·5	
29	E. B.	M.	66	Senile dementia	4·5	4·5	4	
30	J. M.	F.	37	Epileptic	3·5	3	2·75	
31	P. C.	M.	60	Dementia	3 5	3	2·5	
32	M. M.	F.	48	Mania	3·5	3·5	2·5	
33	M. W.	F.	42	Mania	3	3·5	2·5	
34	M. D.	M.	35	General paralysis	3	3·5	2·5	
35	J. H.	M.	55	Epileptic	4·5	4·5	3	
36	P. T.	F.	34	Epileptic	2	3	2·5	Right hemisphere practically a cyst.
37	J. S.	M.	68	Senile melancholia	3·5	4	3·5	
38	G. M.	M.	33	Epileptic	4	3	2·75	
39	C. B.	M.	47	Imbecile	5	5	3	
40	E. M.	M.	35	General paralysis	4	4.5	4	

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by which the volumetric difference is brought out in a most striking manner.

TABLE II.

Diameter in mm.	Cubic capacity of tube 1 ctm. long.
1·5	17·67
1·75	24·05
2	31·41
2·25	39·76
2·5	49·08
2·75	59·39
3	70·68
3·5	96·21
4	125·66
4·5	159·04
5	196·35

If this table be looked upon as a descending series the position may be perhaps aptly compared to the condition of syncope occurring in an otherwise healthy individual, in whom a certain amount of intracranial blood in relation to his cranial capacity means general mental health, a slight diminution causing some headache, languor, lethargy and general malaise, this condition gradually proceeding to unconsciousness, while returning consciousness and mental health gradually occur on the head being placed low with the necessary sequence of increase of intracranial blood. This is analogy closely comparable, though much more acute in its course, to the condition of stupor, which, if this view be correct, must be regarded as a condition of "stenotic" dystrophoneurosis as contrasted with the other forms of mental disease included under this name.

As to the cause of the markedly diminished calibre of the vessels in certain of these cases of stupor, some mention is necessary. In some of the cases it is most probably due to a condition of general arterial stenosis throughout the body, this being most markedly the case in Nos. 9 and 13, where all the arteries from the aorta upwards and downwards were of markedly small size, while the relative thickness of their tunics was undisturbed, this being most probably of congenital origin, the heart also being of small size. The right carotid in Case 4, which is the smallest in the series, presented features other than these, in that the intima, at a point immediately previous to the emergence of the vessel through the dura, presented a

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marked local thickening composed of a fibrous tissue hyperplasia, attaining to a transverse measurement of ·13 mm., whereas the intima at the other portions of the same segment at its greatest only reached ·013 mm.; at this point also there was a gelatinous thickening of the adventitia, which was composed of loosely arranged fibrous tissue with somewhat wide meshes, without formative cells or signs of inflammation, the muscular layer between these two being intact. It is somewhat difficult to give an explanation of the occurrence of this nodule, and as the brain only was permitted to be examined, it is not known whether any other vessel showed a like change, and no other was observed in the meninges. It may be that it was due to a syphilitic arteritis or perhaps a form of periarteritis allied to the cases described by Kussmaul and Maier* under the name of "peri-arteritis nodosa," and also by Meyer,† or possibly it may be an arterial condition secondary to the phthisis (of which the patient died), causing a chronic inflammation of the inner coat such as has been described by Cornil and Ranvier, Heubner, Greenfield, and more recently by Dr. R. Thoma as "nodose chronic fibrous endarteritis," and still more recently studied again by Dr. N. Sh. Ippa, of St. Petersburg. Of whatever significance the condition may be it is certain that it added to the tendency to occlusion of the vessel. In Case 19 the diminution was not so great as occurred in some of the others, but this is especially interesting in the fact that there was present a decided degree of renal cirrhosis, a point which would seem of great importance, when the general views as to the relationship of the vascular system to cirrhotic kidney are taken into consideration, and the more so since it appears that a degree of stupor and lethargy is not at all an uncommon mental condition in chronic Bright's disease, and probably more frequent in the young than the typical "folie brightique" of Dieulafoy.‡

If, then, it be true that in these cases there really is a diminution in the calibre of the basal vessels, it would be natural to assume that the branches given off by these vessels, retaining their normal relation of capacity, would also show this condition, and to see if this were true an examination of the fundus oculi was undertaken in certain of the cases, with the result that there certainly was discernible distinct pallor in this region, though possibly scarcely going beyond what must be looked upon as the limits of physiological variations, and

* "Deutsch. Arch. f. Klin. Med.," 1.
† Virchow's "Archiv.," Vol. lxxiv.
‡ V. Girandeau, "Archives Générales de Médecine,' Jan., 1886.

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there can be no doubt that the terms anæmia and hyperæmia of the fundus are attributive expressions, in the use of which considerable care is required. Dr. Aldridge,* however, from a series of ophthalmoscopic observations in "acute dementia," came to the following conclusions:—"The optic discs are pale, but not the brilliant pallor of atrophy; the tint of the choroid is lowered, and there is a want of that distinctness and sharpness in the picture which is such a marked feature in atrophy; in several cases the retinal vessels are small and shrunken, but no trace of previous tortuosity exists as we so often see in atrophy. In several cases of acute dementia where a very advanced stage has been attained, a certain amount of œdema of the disc, and of that portion of the retina which closely borders on it was seen," thus describing a condition which might *à priori* have been expected.

The condition of the central portions of circulatory apparatus also gives some evidence in favour of the arterial stenosis view, although it varies not only in different cases, but also at different periods in the same case. That hypertrophy of the heart occurs in a certain number of melancholiacs and lypemaniacs has been pointed out by many writers, such as Esquirol, Bayle, Calmeil, Mabille, and others, and this is certainly the condition which obtains in a certain number of the stupor cases, though the physical signs associated with simple hypertrophy are frequently only with difficulty made out during life, and after death it must be borne in mind that the mode in which most of the patients die is one directly inimical to the occurrence of such a compensatory condition, since "it is extremely important to remember that for the production of satisfactory hypertrophy, the cardiac muscle must be healthy and the conditions for its nutrition satisfactory,"† whereas the fact is that in a large number of the fatal cases of stupor the actual factors of atrophy of the heart are present, viz.: a long-continued exhausting disease such as phthisis, in which the heart is usually atrophied, and in addition, very prominently, a diminution or complete absence of bodily activity. Again, it seems probable that if there is congenital smallness of the arterial system, a congenitally small heart may be its accompaniment, a correlation known to occur. But in certain of the cases hypertrophy is a definite condition, able to be diagnosed during life, and the state of compensation of the heart at any given time seems to be a certain guide to the mental condition of the patient, the latter

* "West Riding Reports," Vol. iv.
† Byrom Bramwell, "Diseases of the Heart."

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in all probability depending on the former, for when the heart begins to fail, the anæmia of the brain is certainly increased, which is then manifested by the physical expression of that condition. A good example of this is seen in the following case, in which the weight, mental condition, and cardiac state are shown in tabular form:—

E. A. M., female, æt. 20.

Month.	Weight.	Record of Mental Conditions, etc.	Cardio-Vascular Condition.
1888.	st. lb.		
March	8 8	Stupid, dull, oligoric condition; stares at questioner; does nothing but sit still all day; is taking iron and aloes.	Very pale. Heart sounds very irregular; first sound not clear; no definite murmur; complained of palpitation.
April	9 2	Same condition; slightly improved at end of month.	
May	9 8	Begun to employ herself a little; answers questions, but is silly and flighty in manner.	
June	9 7	Same condition practically.	
July	9 7	Same condition practically.	
August	9 11	Is menstruating for first time since admission; mental condition much the same. Rather duller at actual time of menstrual flow.	
Sept.	9 11	Variable.	
Oct.	10 2	Sometimes silly and frivolous, sometimes dull and obtuse. No steady marked improvement.	
Nov.	10 6	At latter part of this month patient began to show steady and marked improvement; works more steadily; is less frivolous; not dull.	
Dec.	10 7	Improvement continues; works fairly steadily.	Heart regular; aortic second sound much accentuated; medio-sinistral diameter 12·5 ctm. Pulse good tension, incompressible.
1889.			
Jan.	10 5	Improvement mentally maintained.	
Feb.	10 5		
March	10 1	Mentally rather flighty, but not dull; is not working so well as formerly. Taking digitalis and ethyl nitrite.	Heart sounds markedly irregular in force and rhythm; first sound in mitral area "thumping," and not pure; patient complains of palpitation.
April	10 1	Improving mentally; works steadily, and is not so flighty.	
May	10 2	Has maintained improvement, and is discharged recovered.	Heart sounds not quite, but nearly regular; aortic second sound accentuated; medio-sinistral dim. 12·5 ctm.; first sound "thumping" and dull; pulse 60; tension rises rapidly.

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In this case it is seen that in addition to the general pallor of face, etc., when the patient first came under observation, there was present a considerable degree of cardiac erethism, indicated by the palpitation on slight exertion or mental disturbance, combined with rapidity and great irregularity of the pulse, and probably some degree of dilatation from the somewhat impure dull first sound of the heart—in fact, just such a condition as has been described as "cardiac overstrain" by J. Seitz, and more recently by Leyden.* This condition later became considerably relieved, and, in fact, finally disappeared under appropriate treatment, giving place to a compensatory hypertrophy, with markedly accentuated aortic second sound, which was also coincident with a marked mental improvement, which again gave way at the same time as a corresponding change took place in the cardio-vascular physical signs, a condition of things rather suggesting the latter as a cause of the former. As regards the sphygmographic tracings (Dudgeon's sphygmograph) obtained in these cases there is certainly a general resemblance to such as are obtained in a case of aortic stenosis. The line of ascent is to a varying degree oblique, indicating the existence of some arterial obstruction. The height to which this line is raised is always small, which also suggests a central difficulty of propulsion. The condition of the apex varies, the tendency to form a "plateau" occurring in some cases, as has also been observed by Dr. Greenlees,† though this is not very common, and in the same case at the same time the condition may or may not be present, and perhaps may, as Dr. Byrom Bramwell‡ suggests, be due to some instrumental difficulty. If, however, this be not so, it also would suggest some obstruction to the arterial system. The condition of the line of descent varies considerably in relation to the state of the cardiac muscle, and shows the usual reaction on the administration of a nitrite in the course of the tracing. The condition of the heart after death varies, usually, however, being of small size, probably for the reasons given above, an additional reason possibly being that if the heart had responded adequately to the demands made upon it and undergone compensatory hypertrophy the case would have recovered, and a post-mortem examination, therefore, not have been made, and it is, perhaps, where this does not occur that the patient goes from bad to worse and death results. The state of the heart muscle is not by any means constant. In

* "Zeit. für Klinische Med.," Bd. xi., Heft 2 and 3, 105-166.
† "J. Mental Science," Jan., 1887.
‡ "Diseases of the Heart."

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some cases there is distinct fatty degeneration of the fibres, but rarely in any marked degree. More frequently the muscle fibres are cloudy, finely granular, and the striation is as distinct; this, however, may only be a result of the mode of death of the patient. There is in some cases a considerable diminution in the transverse measurement of the individual fibres; for instance, in Case 13 a very large number of them only reached ·006 mm., the largest being ·016 mm., the normal mean being from ·015 to ·023 mm.

As regards the hereditary predisposition in these cases, further observation seems necessary, since it is rational to assume that the earlier a psychosis appears in an individual, the greater was the hereditary tendency in this direction. Crichton-Browne,* however, has said that it seldom depends on a neurotic heredity, having been only able to discover it in three out of twelve cases. In the table below the evidence of heredity as far as could be ascertained in seven unselected cases is seen, the number, however, being far too few, as are Crichton-Browne's, to form any generalization upon.

TABLE III.

Name.	Age on first attack.	Insane History.	History of Phthisis.	Termination.	Duration.
B. M.	21	Father's sister.	Two brothers.	Death, phthisis.	2 yrs. 9 mos.
E. A. M.	20	None	None.	Recovery.	1 year.
S. P.	17	Grandmother & mother.	None.	Death, heart.	1 yr. 5 mos.
M. W.	21	Mother's uncle.	Unascertained.	Death, phthisis.	9 yrs. 9 mos.
C. F.	22	No history	obtainable.	Death, phthisis.	16 years.
M. B.	25	Father's cousin.	Grandmother.	Death, phthisis.	1 yr. 3 mos.
B. H.	17	Aunt, cousin, and brother insane.	None.	Still under	observation.

The age at which this form of mental disease occurs is certainly that at which a congenital arterial stenosis would *à priori* appear to have most effect, that is, at an age when a great mental and bodily strain is beginning to be thrown on the organism, and, in addition, the age about which the growth of the heart,† which is most active at the age of infancy and puberty, is becoming less rapid. The importance of this point seems to be brought out by the case of S. P., in whom there

* "West Riding Reports," iv.

† Beneke, "Die Anat. Grundlagen der Constitutions-anomalieen," 1878.

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was, in addition to the arterial condition, a coarse mitral lesion, so that the demand made upon the heart was presumably enormous, and also in this case the heredity was strong and direct, with the result that the psychosis appeared early, and death occurred early from heart failure. The table is also of interest from the point of view of a prognosis, which apparently may be based upon four principal points:—1st, the age at which the mental manifestation commences; 2nd, the condition of the heart and power of reaction to agents, and presence or absence of organic disease or discoverable congenital defect; 3rd, the condition of kidneys and lungs, or phthisical history; 4th, the effects of food.

Since writing the above, my attention has been directed to a table in the latest edition of Dr. Bevan Lewis's book, "On the Examination of the Brain," in which the diameters of the basal vessels are given in 45 cases of insanity. The forms of insanity, however, are not given, and I am unable to see any very low diameters recorded there.

CLINICAL NOTES AND CASES.

Fifty Years in Bethlem Hospital—The Case of "Mo." By R. PERCY SMITH, M.D., M.R.C.P., Bethlem Hospital.

There died recently in Bethlem Hospital an old man, commonly known as "Mo," for many years a familiar figure, well-known to all resident, and to most of those who have frequented the institution as visitors. Though there is nothing very noteworthy of late about his mental condition, yet the fact of his long residence (50 years) in Bethlem and ten years in other asylums, and in his early life his forcing himself into public notice by stopping the Queen's horse in the Park, render him interesting. Further, he left behind him a memoir headed, "The Political Fool, or the life and delusions of 'Mo,'" which shows the growth of his insanity from its commencement.

According to this memoir, the patient (Edward H.) was the illegitimate son of a merchant in St. Helena, and was born in 1807. He gives as his first recollection a great deal of talk about Buonaparte, in the year 1812. Shortly after this his father, who had become bankrupt, deserted our patient's mother, with whom E. H., however, continued to live in very straitened circumstances. He further describes the arrival of Buonaparte as a

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