do this unless she feels that her mother is able to look at matters from her point of view. Hint tactfully that it is difficult for older people to see eye to eye with youth, but that she should endeavour to direct the patient's energies into safe and harmless channels rather than suppress them.

The reason for this advice is that apparently the girl is somewhat over-sensitive, and takes her responsibilities seriously; and, although the mother was quite right in her disapproval of the automobile ride, she must, in the future, realize that discipline and condemnation should be tactfully given, and also that adolescent girls are confronted with many problems of their emotional life, which leave them floundering unless they are wisely and carefully instructed.

In regard to our plans for further treatment, we have to take into consideration the fact that we cannot go too fast with an analysis. We have to decide whether we shall attract the patient's attention by occupation, or whether we shall try to analyse as much as possible. It is very important to make clear whether a male or female physician can have better *rapport* with and influence upon her. Some homosexual features which we observe in the patient, and her easily stirred up sexuality, need special attention.

I wish to express my thanks to Dr. Adolf Meyer, Director of the Phipps Psychiatric Clinic, for his permission to use the case material, and for his stimulating advice and unfailing encouragement.

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*Some Points in the Histology of the Globus Pallidus.**

By E. Barton White, M.R.C.S., L.R.C.P.Lond.

There are many references in neurological literature to pathological changes in the globus pallidus in diseases accompanied by muscular tremor and rigidity, such as paralysis agitans and post-encephalitic Parkinsonianism.

Scattered among these references are descriptions of a very striking change in the walls of the blood-vessels of the globus pallidus, seen as a deposit—often in large amounts—of amorphous material in the outer walls of the blood-vessels. The amount of this material laid down in the vessel-walls is often enough to obliterate almost entirely their muscular and elastic fibres. When examined by routine methods, the deposit *resembled* very closely the process of calcification. As more cases were described, and the condition was always relatively gross, easy to detect and very striking, there arose a tendency to regard it as pathological, and as

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probably taking part—according to some observers, a *large* part—in the production of signs and symptoms of certain specified diseases.

In 1926 Weston Hirst, working at the National Hospital, Queen's Square, London, examined 100 brains from all varieties of chronic nervous disease, and found this change in the vessels bilaterally and symmetrically distributed, and sharply limited to the anterior half of the globus pallidus in 50 of his cases, and at all age-periods between 20 and 81.

He firmly established the fact that the material was not calcium, but that a large part of it at least was composed of iron, present in a combination which was particularly easy to stain.

He also found this ferruginous material lying free as irregular granules in the corpus striatum, but especially in the globus pallidus, in almost the same percentage of cases.

His results show that (*a*) the deposit is not a senile change, (*b*) it has no relation to arterio-sclerosis, (*c*) the change in the vessel-walls is very frequently seen when no pathological change can be found in the nerve-cells of the nucleus.

Hirst concludes that (*a*) the presence of the vascular deposits is an expression of the proclivity of the globus pallidus to undergo degeneration in the second half of life. (*b*) The deposit of iron salts is to be correlated with the high iron content of the globus pallidus.

Hadfield has extended Hirst's work in two directions: First, by showing that acute bilateral necrosis may affect precisely that part of the globus pallidus in which the change in the vessels is found; and secondly, that a rich deposit of iron salts is present in the vessel-walls of the pallidus in at least 50% of persons not suffering from chronic nervous disease, and from the age of 30 upwards. In Hadfield's series are many cases of presumably normal people dying from accident or misadventure in which the proportion is the same.

I have examined 30 brains from cases of mental disease, and my figures are almost the same as those of Hadfield from non-neurological and non-mental cases, and are clearly in accord with those of Hirst for chronic neurological cases.

As regards the demonstration of the iron in the vessel-walls, this is most satisfactorily shown by staining with ferricyanide of potash and hydrochloric acid, and counterstaining with neutral red.

The deposited material is quite easily seen in sections stained by the hæmatoxylin dyes, when it stains intensely and closely *resembles* calcareous deposit.

The following table gives particulars of 30 cases in which the

pallidum on each side was examined by specific staining methods for ferruginous deposit:

No.	Age.	Sex.	Mental state.	Cause of death.	Deposit in pallidus.	
					Vascular.	Extra-vascular.
1	49	F.	Dementia	Huntington's chorea	—	—
2	18	M.	G.P.I.	G.P.I.	+	+
3	35	F.	D. præcox	Tuberculosis	++	+
4	89	M.	Dementia	Senility	—	—
5	57	M.	Melancholia	Broncho-pneumonia	—	—
6	55	M.	Confusion	Prostate and cystitis	++	+
7	77	F.	Dementia	Cardio-vascular	++	+
8	27	M.	D. præcox	Tuberculosis	—	—
9	77	M.	Dementia	Cardio-vascular	++	+
10	69	F.	Delusional	Endocarditis	+++	+
11	60	M.	Dementia	Lobar pneumonia	—	—
12	64	M.	Imbecility	Nephritis	—	—
13	69	M.	Dementia	Lobar pneumonia	—	+
14	70	M.	,,	Influenza	+	—
15	76	F.	,,	Endocarditis	++	—
16	58	M.	Paranoia	Myocarditis	+	—
17	53	M.	D. præcox	Influenza	—	—
18	45	M.	Epilepsy	Broncho-pneumonia	—	—
19	65	M.	Dementia	Pneumonia	++	+
20	27	M.	Confusion	Influenza	+	+
21	46	F.	Dementia	Pneumonia	++	—
22	51	M.	D. præcox	Influenza	+	+
23	55	F.	Melancholia	Cardio-vascular	++	+
24	47	M.	G.P.I.	G.P.I.	—	—
25	53	M.	,,	,,	+	+
26	88	M.	Dementia	Senility	++	—
27	53	M.	Delusional	Influenza	—	—
28	68	M.	Imbecility	Pneumonia	—	+
29	30	M.	G.P.I.	G.P.I.	+	—
30	63	M.	Epilepsy	Influenza	+	+

The age, sex, form of mental disorder and the cause of death are given, and the presence or absence of iron deposit, both vascular and extra-vascular.

"Minus" means absence of deposit.

One "plus" means the change is just beginning, and does not completely surround the vessel-wall.

Two "plus" means a more advanced case, where the deposit surrounds the vessel-wall.

Three "plus" where the deposit is extreme and invades the whole wall, and there is an extension to the tissues around the vessel.

The last column shows the presence or absence of iron deposited throughout the substance of the pallidus, irrespective of the blood-vessels.

It will be seen that the ages vary from 18 to 89, and that there is a fair assortment of mental and physical states. It is present in a boy of 18, and absent in a senile dement of 89. There are three cases together, all over 60, which are negative. There are two young men of 27, one positive and the other negative. There are 17 + and 13 — in vessels. Extra-vascular, 13 out of 30.

These results agree with Hirst that it is not a senile change.

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I was fortunate in being able to include a case of Huntington's chorea, Case No. 1, and after the observations of others I expected to find this positive. There was no iron deposit at all.

The blood-supply of the globus pallidus is from the antero-lateral branches of the basal branches of the middle cerebral artery.

Though the condition I have described is rarely found elsewhere than in the anterior part of the globus pallidus, these same antero-lateral branches also supply the putamen, the internal and external capsule, the caudate nucleus, and a part of the optic thalamus (Cunningham).

Some veins are affected in the same way, but not nearly so frequently as the arteries, and chiefly in the more advanced cases. Hirst found only 5 in 50 cases.

The process most frequently starts round the adventitia, spreading to the media, and occasionally to the intima in extreme cases.

In the other direction, the Virchow-Robin space outside the vessel-wall may be filled with this deposit, and the immediate tissues round the space may be dotted with varying-sized masses.

In 13 out of my 30 cases there is a scattered deposit through the pallidus irrespective of the vessels. This may be seen to a less degree in the putamen, where the vessels are free.

The process consists of an infiltration by iron salts, the usual tests failing to demonstrate the presence of calcium.

As far as these 30 cases of mental disorder are concerned, they show that the proportion of positives, *viz.*, 17 in 30, differs little from the findings of Hirst, and are much the same as those of the normal brain as shown by Hadfield.

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*Mental Disorder in Cardiac Disease.** By CAREY F. COOMBS, M.D., F.R.C.P., Physician, Bristol General Hospital; Consulting Physician, Bristol Mental Hospital.

I do not propose to attempt any critical review of what has already been written on the subject which forms the title of this paper, but merely to lay before you my own experience. At the same time I may remind you that there is distinguished support for the view that a close association exists between insanity and disturbances of the cerebral circulation caused by cardiac defects.

Now, it may seem presumptuous to question or even to examine a hypothesis to which eminent men have subscribed their belief. Yet my own experience of cardiac disease leads me to another

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