

final draft

PROPOSED BIOPSY AND EXPERIMENTAL INVESTIGATION OF
DEMENTIA PRAECOX.

Our interest in a biopsy study of psychiatric patients dates from the demonstration* that acute swelling of oligodendroglia exists in the cerebral hemispheres of patients in coma or delirium secondary to systemic disease. Agonal and post-mortem alterations of these cells is so rapid that autopsy examination of them is useless.

During the past two years Dr. Arthur Elvidge has removed specimens of cerebral tissue in a hollow needle from thirteen cases of dementia praecox** with the aid of Dr. G.E. Reed at the Verdun Protestant Hospital of which Dr. C.A. Porteous is Medical Superintendent. Studying these specimens at the Montreal Neurological Institute, Elvidge has found acute swelling of oligodendroglia to be consistently present.

This finding would suggest that the brain of such a patient was being acted upon by an abnormal biochemical substance. It is therefore desired to make a biochemical and endocrinological study of the substances which will produce acute swelling of oligodendroglia in animals and determine whether the blood and cerebrospinal fluid of praecox patients are capable of reproducing in such animals changes in oligodendroglia similar to those found in the patients themselves.

*Penfield, W. and Cone, W., Arch. Neur. & Psychiat. 1926, 15, 131.

**Also certain other psychotic patients.

We have long been interested in neuroglia changes in this laboratory. Well trained workers are at the moment available to undertake each aspect of the proposed research, but the scientific budget of the Neurological Institute which is \$10,000 less annually than was anticipated, is already completely pledged. If we are to go forward with this investigation on an effective basis we must have financial assistance which should be for a period of five years. The studies may be very briefly outlined as follows:

A. Biopsy study. Dr. Elvidge* proposes to enlarge considerably the present series of cases of dementia praecox, and to expand the histological studies, making an exhaustive analysis of the nerve fibers, boutons terminaux, ganglion cells and myelin in future specimens to complete the biopsy analysis. The biopsy operations are carried out at the Verdun Hospital but the histological studies are made in the neuropathological laboratory of the Institute.

An experimental Fellow**, well trained in psychiatry is needed to work with Dr. Reed and Dr. Elvidge, to make more detailed clinical analyses at the Verdun Hospital and to carry out himself the added histological procedures which he can be taught in our laboratory at the Institute. This Fellow would also help in the experimental work described below.

* Dr. Arthur Elvidge is a neurosurgeon who has been trained in neuropathology in our laboratories. He secured a Ph.D. in physiology for his work on the reticulo-endothelial system, after graduating in medicine and before entering the clinical field of neurology and neurosurgery.

**Dr. Robert Fleming who is trained in psychiatry and is at present studying neuropathology in the Institute would be suitable to and possibly available for this position.

B. Experimental study. The problem of analyzing the production of acute swelling of oligodendroglia in animals can be undertaken by Dr. Donald McEachern (trained in biological chemistry under Meyerhoff in Germany, and at Johns Hopkins) in conjunction with Dr. Elvidge and the Psychiatric Fellow. McEachern will be in charge of our Laboratory of Biological Chemistry beginning next January. The animal experimental laboratories in the Neurological Institute are equipped for the physiological part of this work, and the chemical laboratories for that type of work, but an additional research technician would have to be secured for the biochemical analyses. And additional animals would have to be secured, especially monkeys and even chimpanzees.

Penfield and Cone have shown that acute swelling of oligodendroglia can be produced in animals when they are placed under conditions similar to those which produce acute coma and delirium in man. The proposed study would include an analysis of the elements circulating in the blood of man and animals which are capable of producing this cytological change in the brain.

This study will further include a similar analysis of the blood and cerebrospinal fluid of cases of dementia praecox. Initially the study will be carried out by biochemical methods. But it will in all probability lead to an analysis of the endocrine hormone in the blood of animals and patients afflicted with dementia praecox.

We expect to call on Professor Collip for help from his department on the endocrine aspects of the work. Therefore we may make a further request for financial help in conjunction with Professor Collip at the end of the first year.

Respectfully submitted,

Wilder Penfield.

COSTS OF PROPOSED DEMENTIA PRAECOX INVESTIGATION.

Psychiatric Fellow at \$125.....	\$1,500.00
Part time salary of Dr. Elvidge at \$200. to enable him to have greater freedom from practice.....	2,400.00
Research biochemical technician at \$115.	1,380.00
Animals including monkeys & chimpanzees.	1,200.00
Clinical Fund* and miscellaneous.....	<u>1,500.00</u>
<u>TOTAL ANNUAL EXPENSE...</u>	<u>\$7,980.00</u>

*The Clinical Fund would be used to transfer suitable patients to the Neurological Institute when indicated and to carry out studies which the patients could otherwise not afford, as well as for special equipment and supplies either at Verdun or the Institute.

32 days

SUPPLEMENT.

Estimated Additional Expense.

Hormone & transplantation problem.

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| 1. Colony 1000 rats, food at \$40. per mp..... | \$ 480. |
| 2. Additional boy to care for colony at \$50. per mo. | 600. |
| 3. Tissue culture technician at \$110. per mo..... | 1,320. |
| 4. Biochemical technician at Verdun Hosp. at \$115.... | 1,380. |
| 5. Special materials needed for laboratory at Verdun. | 1,200. |

Experimental problem.

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| 6. Biochemical technician at \$115..... | 1,380. |
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General.

- | | |
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| 7. Clinical Fund and miscellaneous..... | 1,000. |
| 8. Salary Fund: | |
| Dr. Anderson. |) |
| Dr. Elvidge. |) |
| Dr. Haymaker. |) |
| Psychiatric Fellow. |) |
| | 7,200. |

TOTAL ANNUAL EXPENSE.....

\$14,560.00

Item #4, the technician for Verdun Hospital would be necessary for the special examination of hormones and anti-hormones, analyses of spinal fluid etc. and, Item #5, the extra materials are required for such work. The Clinical Fund (Item #7) would be used to transfer suitable patients to the Neurological Institute and to carry out studies which the patients could otherwise not afford, as well as being used for new apparatus.

This is an estimate of expense only and represents what would have to be added to the present budget of the Neurological Institute in order to undertake this proposed major research. The fund would be used only for the purposes of this research and would be administered by the Director of the Institute subject only to the approval of the donors. If the problem is to be undertaken at all it should be on a basis of five years so that comprehensive plans can be made.