PROPOSED LABORATORY OF NEUROCYTOLOGY.

It is proposed that a laboratory be equipped for the study of the central nervous system particularly by means of staining methods used by certain Spanish investigators. Among other things these methods demonstrate the structure of cells in the brain which are very numerous but have been previously unrecognized. *

The study of these cells opens up a promising field for research. Such study can yield the utmost only if experimental and pathological changes of these cells is accompanied by an investigation of their developmental changes, an investigation which has not yet been undertaken. Therefore, in the proposed laboratory the nervous material to be studied would be derived from (1) animal experiments in the Surgical Research Laboratory of Columbia, (2) neurological operations in the Department of Surgery of Columbia and Presbyterian Hospital, (3) autopsy material in the Department of Pathology, Presbyterian Hospital and (4) certain vertebrate and invertebrate animals to be kept near the laboratory.

The laboratory which would be called the Laboratory of Neurocytology would be inter-department, being allied to the Departments of Surgery and Pathology, and would bring in a comparative anatomist from outside. It must of necessity be physically near the Pathological Laboratory of the Presbyterian Hospital so that neurological autopsies could be done by the personnel of the proposed laboratory and the human tissue obtained as fresh as possible.

PERSONNEL

(1) A neuropathologist. A well trained neuropathologist, Dr. E. V. Cone is available for this position. He has had four years in standard neuropathological methods at Iowa University under Prof. Orton. He is at present, on a National Research Fellowship, studying oligodendroglia with me at a bench which is assigned to us in the Pathological Laboratory. Dr. Cone has refused a number of flattering offers preferring to continue the study with the Spanish methods. A Fellowship of at least $3500 should be available for him. He would see cases clinically as well as at autopsy, and study cellular changes in pathological and experimental material.

*Footnote. By these methods it is possible to stain neuroglia with great distinctness but also to stain two other types of non-nervous cells previously unrecognized. These cells are called by Del Rio-Hortega microglia and oligodendroglia and have been described by him in the central nervous system of man and all mammals so far examined. Certain important changes have been described for microglia in pathological conditions. None for oligodendroglia as yet. I am publishing certain typical changes shown by microglia in the January number of the American Journal of Pathology (as well as in the Laboratory Journal edited by Ramon y Cajal). Also a further description of Oligodendroglia will appear in the January number of Brain. This will be the first published confirmation of the work of Rio-Hortega on these cells.

(2) A comparative anatomist. His problem would be the study of the phil-ogenetic and perhaps the ontogenetic development of the cells in question. No available man has been foundas yet. It is hoped to secure a young man somewhere in the country who would fit the problem. Failing that, the position would be offered to one of two promising Spanish pupils of Rio-Hortega. A fellowship of about $3500 seems necessary.

(3) I should supervise the laboratory and try to help the men adjust the technique to their various problems. I should also continue the study of thepathological and experimental material as during the past two years, hoping that somewhere in the new field that has opened before us will be found a lead that will point the way to the solution of one of the many unsolved problems in Neurology such as Hydrocephalus and Epilepsy.

(4 & 5) Two other voluntary workers. For example: Prof. Bazett of the University of Pennsylvania has asked that he may send to me one or more of the students working under him for the degree of Ph. D. in Physiology who, as he proposed, would remain a period of months to undertake an assigned problem, and learn the Spanish methods. There are other students and members of the Staff at the Presbyterian Hospital who have expressed themselves as anxious to take up a problem.

(6) A technician. A technician can be of considerable help but the major technical work for these methods must be done by the individual investigator. The chief work of the technician would be to carry out ordinary standard methods for comparison. I have trained a technician in the Pathological laboratory, and he could be transferred.

(7) A porter for one half day. There is much glassware to be cleaned. $600 should be available for this purpose.

The Laboratory and its Equipment.

The Presbyterian Hospital has offered to make certain readjustments so as to render available for the proposed laboratory a room 36 feet long by 13 feet wide. With certain minor alterations this room can be prepared for five workers and a technician. The laboratory should be arranged so the table and cupboards of each worker would be completely equipped for silver technique with high power microscope and adequate shelf room. The technician's room should be equipped for the Spanish and the ordinary methods as well.

A tentative list of equipment and estimate of the cost of the whole undertaking are appended. It should be possible to carry the work through in three years. In that length of time definite results should be obtained both on the pathological and developmental sides. After that the Presbyterian Hospital will be moved. The entire equipment including furniture can be made movable and thus will not be lost.

Finally it is evident that successful treatment of many pathological conditions of the central nervous system is prevented by our ignorance of the nature of the abnormal conditions involved. We have at hand a new weapon of attack. A combined study, such as the one proposed, of these previously unrecognized groups of cells whose number in the brain exceeds that of any but nerve cells is certain to yield new facts. And whether these discoveries come from the developmental, the experimental or the pathological study, it is possible that a new therapeutic attack may be indicated on one of the maladies at present looked upon as hopeless. Whether or not the new light may render possible the cure of hydrocephalus as I have hoped or some other entirely different condition, as epilepsy or encephalitis, at least the field lies at the frontier of our knowledge where intelligent work is necessarily productive.

5	Microscopes and 3 high power lenses.	$779	
	Journals and books for reference	300	
1	Incubator.	240	
1	Parafin oven	65	
1	Filing cabinet	140	
7	Tables for staining	166	
10	Cupboards	355	
1	Cabinet for chemicals	55	
1	Freezing microtone	75	
	Alterations in room (partitions, plumbing, etc.) .	469	
	Estimate of total cost of equipment	$2644	$2644

Items of running expenses

Research Associate	$3500	
Fellowship for Comparative Anatomist	2500	
Technician	1500	
Pay for half-time porter	600	
Chemicals, animals and running expenses	1500	
Total running expenses for 1925 - 1926	$9600	9600
Running expenses for 1926 - 1927		9600
Running expenses for 1927 - 1928		9600
Grand total for 3 years		$31,444