RELATIONSHIP OF NEUROPATHOLOGY TO NEUROLOGY, PSYCHIATRY AND PATHOLOGY

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Neuropathology has come of age, figuratively speaking, in the last half century and owes its development and progress to individual research worker and teams of investigators who were connected with Institutes or Departments of Neurology and Psychiatry.

The intimate relationship of neuropathology to neurology and psychiatry and the binding tie of parentage of neurology and psychiatry to neuropathology have been challenged recently, and there is a tendency on the part of some general pathologists to claim the leading role in directing the future of neuropathology.

The following random thoughts, which I will make as concise as possible, have as their main objective to oppose this amalgamation of neuropathology with or dependency on general pathology.

A brief historical review of the development of neuropathology is in order.

In Germany, the development of neuropathologic studies received its first impulse from the interest in neuropathology on the part of eminent psychiatrists, such as: B. von Gudden and C. Wernicke, and of eminent neurologists, W. Strümpell and H. Oppenheim, all of whom were concerned with the structural foundation of neurologic and psychiatric disorders. Later on Nissl and Alzheimer devoted particular attention to neuropathologic investigations and their contributions constitute a major milestone in the development of our present day neuropathology. As is well known, Nissl became the successor of Kraepelin as Professor of Psychiatry in Heidelberg, and Alzheimer, in 1912, was appointed to the chair of Psychiatry at the University of Breslau.

In France, to quote only a few outstanding names taken at random, one has to mention the following ones: J. M. Charcot, Pierre-Marie, J. J. Dejerine, H. Claude, A. Souques, J. A. Sicard, C. H. Foix, I. Bertrand, G. Guillain, and G. Roussy in order to establish the fact that the development of neuropathology in that country derived from the activities of outstanding neurologists and psychiatrists.


In Italy, E. Lugaro, U. Cerletti, G. Perusini, G. Mingazzini and O. Rossi, outstanding neuropathologists, taught both neurology and psychiatry in Italian universities.

In Austria-Hungary, K. Schaffer, H. Obersteiner, A. Pick, E. Redlich, C. von
Economo and O. Marburg branched off into the field of neuropathology from the field of clinical neurology or psychiatry.

In Belgium, A. van Gehuchten, a pioneer in the field of research of functional and pathologic anatomy and the present outstanding neuropathologist of that country, L. van Bogaert, also stemmed out from the field of clinical neurology.

In Roumania, the outstanding contributions to neuropathology made by the eminent neurologist, G. Marinesco are well known.

In Switzerland, A. Forel, C. von Monakov, M. Minkowski, F. Morel, E. de-Vries and other outstanding contributors to neuropathology were or are experienced neurologists and psychiatrists.

In Sweden, the basic correlation between the pathology of the optic system and its cerebral cortical representation is the result of investigations of S. E. Henschen, an eminent clinical neurologist.

In Holland, Verhaart, in Denmark, K. Krabbe, and in Japan, Uchimura, outstanding neuropathologists, are primarily clinical neurologists and psychiatrists.

In Poland, the creator or neurobiologic and neuropathologic science, Flatau, was a clinical neurologist of world-wide renown.

In Russia, to mention only one name, V. M. Bechterew, whose fame as a clinical neurologist is a matter of record, contributed more than anyone else in that country to the functional and pathologic anatomy of the nervous system.

In the United States, following the glorious traditions of eminent clinical neurologists and psychiatrists, such as J. J. Putnam, A. M. Starr, C. H. Dana, W. Spiller, R. Hunt, H. Cushing, A. Meyer, neuropathology has been pursued by G. B. Hassin, P. Bailey, J. H. Globus, S. Cobb, W. Freeman, A. Weil and myself all of whom are well known for their clinical background of neurology or psychiatry.

A further development of neuropathology in the United States took place with the creation of a Club of Neuropathologists as far back as 1924, a Club which later developed into the present American Association of Neuropathologists. This Association, of which I have been a past President and Secretary for over 20 years, included and includes among its members many prominent neurologists and psychiatrists the majority of whom did, at the same time, outstanding work in Neuropathology. At random I mention the following names: Adams, Alexander, Alpers, Bailey, Baker, Benda, Brown, Cobb, Cone, Courville, Davidoff, Davidson, Denny-Brown, Elvidge, Eisenhardt, Ferraro, Fisher, Foley, Forster, Freeman, Globus, Grinker, Haymaker, Jervis, Josephy, Lichtenstein, Luhan, Malamud, Merritt, Meyer, Moore, Negrin, Penfield, Putnam, Richter, Riese, Riggs, Roizin, Rupp, Scharenberg, Steiner, Stern, Stevenson, Tarlov, Vonderahe, Walker, Weil, Winkelman and Yakovlev. Only occasionally does one meet among the members of the American Association of Neuropathologists with names of workers as for example Dublin, Hurteau, Kernohan, Kubik, Neuburger, Wolf, and Zimmerman, who by their training and interests are more closely connected with general pathology.

Presently, out of 90 members who constitute the membership of the American Association of Neuropathologists, at least 75 members can be considered as
investigators, interested mainly in the correlation of neuropathology with the clinical aspects of neurology and psychiatry. Most of them work in laboratories attached to Departments of Neurology and Psychiatry of various universities or Psychiatric or Neurologic Institutes. Most of the members of the Association are members of the American Neurological Association and are Diplomates in Neurology and Psychiatry. Only very few members are Diplomates in Pathology.

A further step in the development of neuropathology in the United States was the creation of the Journal of Neuropathology and Experimental Neurology founded by G. B. Hassin, J. H. Globus, A. Ferraro and A. Weil, all of whom derived their interest in neuropathology from their clinical interest in neurology and psychiatry. The Editorial Board and the Advisory Editors of the Journal in the United States and abroad represent mostly scientists who are fundamentally interested in both clinical neurology and psychiatry.

A third step in the further development of neuropathology in this country and abroad was the organization of the First International Congress of Neuropathology in Rome (September, 1952). To the organization of this Congress I devoted a great deal of effort as representative of the United States and in my capacity of Secretary General of the Congress.

The Transactions of the First International Congress of Neuropathology, soon to be published, will show that over 35 nations participated at this very successful Congress, and that the great majority of its members as well as the great majority of readers of papers and discussors came from the field of neurology and psychiatry.

Thus, the historical development of neuropathology and its present organization all over the world establishes a well accepted principle that neuropathology owes its parentage to neurology and psychiatry, and still is an integral part of neurology, psychiatry and more recently one may add of neurosurgery.

This close relationship of neuropathology to clinical neurology and clinical psychiatry is indeed well justified. Teaching and research in neuropathology must serve a double purpose: (1) To increase our knowledge of new etiological and pathogenic mechanisms of neuropathologic findings, and (2) to correlate such findings in the central and peripheral nervous systems with the clinical features of various neurologic and psychiatric disorders.

To properly carry on the important phase of correlating neuropathologic and clinical neurologic and psychiatric findings, the mere description of microscopic slides is far from being dynamic and satisfactory. The description of pathologic findings must be correlated with the localization and distribution of such findings.

Here, we enter into the very important subject of the value of such a distribution and localization in the light of neuroanatomical and neurophysiological organization of the nervous system. A good neuropathologist must, in my estimation, possess a solid knowledge of neuroanatomy and neurophysiology including experimental neurology in order to be able to correlate his histopathologic findings with the clinical ones.

Only if a neuropathologist is well acquainted with the topographic anatomy
and physiopathology of the cerebral circulation will he be in a position to properly evaluate the clinical pathologic relationships responsible for the various cerebral and cerebellar vascular syndromes.

Only if a neuropathologist appreciates the importance of the basal ganglia and is aware of all their connections and functional significance will he be able to evaluate the meaning of pathology localized in such areas.

Only if a neuropathologist is acquainted with the function of the mesencephalon, including the red nucleus and the substantia nigra, will he be in a position to establish a sound clinico-pathologic relationship of complicated mesencephalic syndromes.

Only if a neuropathologist is well acquainted with the anatomy and physiology of the cerebellar system will he be in a position to evaluate the meaning of pathologic findings in the very complicated cerebellar structures.

Only if a neuropathologist is well acquainted with the anatomy of the spinal cord will he be able to establish a correlation between pathology of the spinal cord and its corresponding clinical manifestations.

Only if a neuropathologist is acquainted with the anatomical connections of the prefrontal and frontal lobes, with the important and complicated thalamic and sub-thalamic areas, with the cortical areas of the so-called vegetative brain and with the experimental data related to their functional significance will he be in a position to evaluate the correlations between neuropathologic findings in the frontal lobes and related clinical manifestations, especially in the field of emotional disturbances.

All together, the points raised in the previous paragraphs establish, in my mind, the fact that beyond any doubt a good neuropathologist should be equipped with knowledge, which I would term indispensable, of neuroanatomy, neurophysiology, physiopathology, clinical neurology and clinical psychiatry.

Knowledge of clinical neurology and clinical psychiatry as well as knowledge of neuroanatomy, neurophysiology and physiopathology is nurtured through the continued close contacts of the neuropathologists with clinical neurologists and psychiatrists available in appropriate departments of clinical neurology and psychiatry and not in departments of general pathology.

Thus, while the development of neuropathology in the field of training, research and teaching is closely related, by derivations of the past and needs of the present, to clinical neurology and psychiatry and is based on strong foundations of neuroanatomy and neurophysiology, I have failed to find in the past and recent history of the development and organization of neuropathology any important documentation pointing to the same systematic relationship between neuropathology and general pathology.

It is my strong belief, therefore, that neuropathology should remain, as in the past, an integral part of neurology and psychiatry, and should find its place as a
division of every well organized department or Institute of neurology and psychiatry.

Although in the past, neuropathology was developed essentially by men carrying on, at the same time, research and teaching in the field of clinical neurology and clinical psychiatry, neuropathology has now reached a higher point of specialization, and its problems have so increased that presently individual workers can justify the dedication of their full time to the special field of neuropathology in laboratories of neuropathology attached to all well organized departments of neurology and psychiatry. However, the fact that a neuropathologist may devote most of his time to neuropathologic investigations does not absolve him from neglecting the continuation of his training and research in an atmosphere devoted to clinical neurology, psychiatry, neuroanatomy and neurophysiology.

Any attempt to separate neuropathology from its natural and logic parentage and close relationship with neurology and psychiatry and transfer it to the Department of General Pathology would, in my estimation, be a serious mistake. It would constitute a step backward which would be detrimental not only to neuropathology, but also to both neurology and psychiatry. To allow neuropathology to drift into the orbit of general pathology would constitute in my opinion the equivalent of approving the backward step of fusing again the field of teaching, research, and clinical investigations of both, neurology and psychiatry, under one single head of a department or fusing again neurosurgery with general surgery or fusing again orthopedic surgery with general surgery.

If deeply rooted and fruitful traditions have to be destroyed, the action must be justifiable by a belief that the change is for the good and to the best advantage of neuropathology, clinical neurology and clinical psychiatry. The approval of a change for the purpose only of administrative convenience or academic compromise, knowing that, ultimately, the change will be detrimental to all concerned would constitute a lamentable betrayal and would clash with sound scientific judgement.

A neuropathologist needs advice and guidance from clinical neurologists and psychiatrists. It is at the Head of departments of neurology and psychiatry of Medical Schools as well as at the Head of Institutes of neurology and psychiatry that one finds individuals well equipped to direct and inspire not only clinical investigations in neurology and psychiatry, but also research in the field of neuropathology upholding its two main objectives elaborated above. There, too, one finds those who appreciate teaching following the lines of the very essential and inspiring clinico-pathologic correlations.

To expect a Pathologist who heads a department of general pathology in a medical school to possess all the necessary knowledge to properly direct teaching and research in neuropathology in addition to the vast knowledge of general pathology, structural pathology, functional pathology, skin pathology, surgical pathology and general experimental pathology, which he must possess in order to carry on satisfactorily his duties as Head of the Department of Pathology, would, in my estimation, be asking the impossible.

Undoubtedly, exceptional men may be found with the capacity of carrying this
herculean task, but from a practical standpoint one cannot approve of important fundamental changes on the basis of a few exceptions. To transfer the activities of neuropathology and entrust its future to the Department of General Pathology would constitute an unnecessary inflation of the Department of Pathology, an unwarranted mutilation of the departments of neurology and psychiatry, an unjustified hindrance to the proper development of neuropathology, and a bad precedent which might be followed in the future.

Another important danger of such a transfer could be the gradual undue emphasis in the training of an aspiring neuropathologist on subjects pertaining to the field of general pathology at the expense of subjects related to clinical neurology, clinical psychiatry, neuroanatomy and neurophysiology. Such a deviation from the present efficient and basic training would constitute a serious setback for the neuropathologists of the future.

I do favor the idea that a neuropathologist should receive an initial training of at least one year in general pathology, but once such a training has been acquired, his main associations should center within the Departments of Neurology and Psychiatry where he ought to continue his training and pursue his activities.

This brings me up to the very important question of certification in neuropathology. At the American Association of Neuropathologists there have been discussions dealing with this very important problem. A special committee was appointed to study this topic but no final report was ever received or agreed upon. The great majority of neuropathologists felt that certification should be given by the American Association of Neuropathologists because of the very important issue of the basic qualifications of the candidates in clinical neurology, clinical psychiatry, neuroanatomy and neurophysiology. The members of the American Association of Neuropathologists felt that they were better judges of such qualifications in view of their personal experiences in the matter.

On the basis of the requirements for training and qualifications of a neuropathologist based upon the various considerations discussed in this paper, including one year of general pathology, it might be advisable that a special Board for certification in neuropathology be set up by the American Association of Neuropathologists. The present certification in neuropathology by the American Board in Pathology has been established without any official consultation or discussion with the American Association of Neuropathologists contrary to the policies followed by other National boards, where qualifications for candidates were worked out in consultation with all National organizations concerned.

The new proposed Board could consist of a member of the American Association of Pathologists, a member of the American Neurological Association, a member of the American Psychiatric Association and two members of the American Association of Neuropathologists.

Details of such an arrangement should, naturally, be taken up and discussed at the proper time by the proper representatives of the various associations or organizations involved.