

(Supplementary Note)

Viggo Christiansen is Professor of Neurology in the University of Copenhagen. He has, however, no neurological service, only an out-patient clinic where he sees ambulatory patients three afternoons a week with his three assistants. This clinic is in the Rigs Hospital and patients are sent to him from all services in the hospital for consultation. The examinations in the out-patient clinic are in general rather carelessly done, although the diagnostic work may possibly be good.

Within the next few months Christiansen will be given a service of fifty six beds as part of the Rigs Hospital but housed in the Military Hospital about a half kilometer distant. He will there have only organic neurological cases and the surgery will be done there by Dr. Schaldemose. Professor Wimmer, a man with an excellent scientific reputation, is Professor of Psychiatry.

Dr. Schaldemose is chief of one of the two surgical divisions in Rigs Hospital. Neurological cases are sent to him and there seen by Christiansen in consultation. Schaldemose was away and I did not see him. He apparently does osteoplastic operations and in the suboccipital operation he has been able to completely enucleate five or six cerebello-pontile angle tumors without splitting the capsule.

In the fifteen years that Christiansen and Schaldemose have worked together they have had about 500 brain tumors. They use no ventriculography, no encephalography, no ventricular dye injections, no hypertonic intravenous injections. I asked him in what percent of the brain tumor cases they were able to localize the tumor. He hesitated and then said 30 to 35 %. Then, after thinking, he said, "Perhaps 50 %." Then with certain pride and pointing to himself, he said, "When we make a diagnosis of tumor the patient always has it - we never make a mistake!" He seems to be oblivious of the fact that he should also be able to localize the tumor in nearly every case. In the unlocalized brain tumors they do a palliative subtemporal decompression.

Christiansen turns to the French School of Neurology for inspiration. There is no neurohistological work being done, no investigation of any sort and they are completely ignorant of modern methods of neurosurgical diagnosis. The clinic, as a whole, is uninspired and unscientific and worst of all, the chief is obviously satisfied with it. Yet when asked what he considered the

ideal relationship between neurology and neurosurgery, he said, " I think Cushing has it best. The surgeon should be a neurologist."

In Oslo there are two neurologists, Magnus who is both neurologist and neurosurgeon and Monrad Krohn who is University Professor of Neurology.

V. Magnus is in some ways a unique figure. A neurologist working quietly and with neither University nor hospital clinic he has developed into an active modern neurosurgeon. When he was a young man he worked with Dejerine in Neurology and for six months with Horsley in Neurosurgery. He returned to Oslo in 1902 and began to operate ~~on~~ upon animals while he waited for the gradual appearance of a practise.

At present he is part owner of the Wergelandsveiens Klinik, a converted mansion containing about thirty two beds and open to other physicians. Here he sees his numerous private patients as well as his hospital patients. His operating room is modern and he uses the most recent technical devices of the American neurosurgeons. Although an enthusiast for Horsley he now makes osteoplastic craniotomies and resects the sensory root of the ~~trigeminal~~ trigeminal ganglion as is being done in America. He reported 208 brain operations in the Surgical Congress at Rome with a 10 % operative mortality, statistics which have never been equalled, to my knowledge, in Europe.

He omits hysterical cases from his practice but embraces all of Neurology. Had he had a proper clinic it seems likely he would be able to show pathological work in which he was trained but which he found too expensive to keep up, because of the cost of supporting his growing family. Consequently, he relies on the indiscriminating reports of a general pathologist with regard to the nature of his tumors. His records are also not such as to make statistics easy and, his only assistant being a doctor friend, the technical part of his surgery is carried out under difficulties.

He has published very little outside of local Norwegian journals. I am told by others in Oslo that, had the chair of Neurology fallen vacant twenty years ago, he would have been chosen. Now, although he is still vigorous, he is nearing sixty and was considered too old for the chair when it fell vacant in 1922. He has made no important original contributions but he is an able neurologist and a neurosurgeon with few equals.

Monrad Krohn is Professor of Neurology in the University of Oslo

and head of the neurological service in the national hospital, Rigs Hospitalet. Here he has forty two beds and an excellent out patient clinic. The clinic was built in 1927 and contains an operating room yet to be christened. Krohn hopes to send an assistant to America soon to be trained in Neurosurgery. Failing that, he has some thought of taking up the knife himself, following the example of Foerster, Magnus and Puusepp.

There is no neuropathology being done in this clinic and the investigation is all of a clinical and diagnostic nature. As a clinician he very much resembles the English neurologists under whom he was trained at Queen's Square, London. He is interested in clinical signs but at present there is no therapy being carried out. However he is alive to the need. He remarked that it does not work to send neurological cases to a general surgical department and showed me a lovely child with a midline cerebellar tumor waiting to die because the surgeons feared to undertake this grave operation.

Henry Marcus is Professor of Neurology in the Royal Carolin Institute of Stockholm. He has a clinic of about thirty five beds in the Seraphimer Lazarett, the state hospital. He had also an active neurological outpatient service in the same hospital. Working under Professor Marcus are three full time assistants and two voluntary assistants, in addition to the chief of the outpatient service who has his own ~~xxxxxx~~ practice.

In connection with the service is a pathological laboratory, not active at present due to hospital alterations. A grant of money has been made and it is hoped to open a laboratory of neuropathological anatomy situated in the Laboratory of Histology.

Surgical cases are sent to Dr. Herbert Olivecrona in the surgical department of the hospital. Dr. Olivecrona was away unfortunately, but it is evident that he has developed neurosurgery to a very considerable extent. His book on "The Surgery of Brain Tumors" is excellent from a clinical and operative standpoint though it is lacking in pathological studies. Olivecrona is a former assistant of Cushing's but is evidently not trained in neurology. He has not found it possible to restrict his work to neurosurgery but does general surgery as well. The relationship between neurosurgery and neurology seems to be more satisfactory here than in Denmark because the neurological department is in every way better.

Professor Marcus is interested in the morbid pathology of the brain

and, among other things, has done careful fundamental work on the pathology of dementia paralytica and Korsakow's malady. He conducts evening graduate courses on the neuroses. In his opinion the ideal organization would arrange for a department of Psychiatry and one of Neurology with separate clinics but a common out patient service. Under Neurology he would include the neuroses and the neurosurgery would be done there. He would make the neurosurgeon a professor as soon as it became possible.

Dr. Nils Antoni is Privat Docent in Neurology and former assistant to Professor Marcus. He has done a good deal of exhaustive work upon tumors of the spinal cord and is now interested in clinical investigation. Dr. Eric Ingvahr, who has just been made Professor of Histology at Upsala, was unfortunately not seen. He has done good work on some aspects of the central nervous system.

Neurology in Stockholm is better organized than in Copenhagen or Oslo. In addition to diagnosis the members of Professor Marcus' Department work in neuropathology and are studying experimentally methods of treating encephalitis. Neurosurgery, although removed from neurology, seems to be well done. With the further development of the histological work for which Stockholm has always been famous, and a closer association with surgical neurology, the clinic could be very favorably compared to the clinics of Foerster and Brouwer, although the chief is perhaps less brilliant than either of the two just mentioned.

In all three of the Scandinavian capitals the necessity of specialization for a neurosurgeon seems to be better recognized than elsewhere in Europe and Magnus has made a successful exclusive speciality of neurology and neurosurgery.

4

Impressions of Neurology, Neurosurgery, and Neurohistology
in Central Europe.

Wilder Penfield - 1928.

At the present moment there is no other branch of medicine in which clinic organization is of greater importance than in the study and treatment of nervous and mental diseases. In no other group of diseases is there greater need for specialized study since nowhere else lie so many unsolved problems and so great a field for possible advance.

The report which follows must of necessity be incomplete and possibly at times unfair to individuals, based as it is upon interviews which were occasionally hurried and upon often incomplete familiarity with the publications of these individuals. Certain striking virtues and defects in the clinics visited are, however, self evident. If I presume to criticize them it is against the background of my familiarity with English Neurology, American Neurosurgery and Spanish Neurohistology, and not from any personal feeling of superiority. Professors Bumpke in Munich, Jacob in Hamburg, and Kappers in Amsterdam were not seen and there are of course other regrettable omissions.

The neurologists, neurohistologists, and neurosurgeons will be discussed in separate groups. Foerster, who is both surgeon and neurologist and Brouwer, who is both neurologist and anatomical histologist appear each in two groups.

Neurology.

F.H. Levy of Berlin is a Professor Ordinarius in the second University Medical Service at the Charite Krankenhaus. He has a small ward devoted to neurological cases. The majority of the patients in his beds were of the museum variety, whose neurological symptoms were interesting but not curable by any means yet available. There was however one case of cerebellar tumor with a high grade papilloedema. In this case Levy proposed to do a ventriculogram himself (a procedure which most American neurosurgeons would consider unwise and unnecessary under the circumstances) and then he proposed to call in the surgeon, Dr. Heilmann, to operate. Dr Levy is a clever man much interested in neurophysiology. The spinal fluid is carefully

studied in his clinic but the effective therapy seems to be confined to antisyphilitic procedures, early serum treatment of poliomyelitis and the usual supportive medical measures.

Bonhoeffer is Professor of Psychiatry in the University of Berlin and, according to rumor, opposes the creation of a chair of Neurology, considering this subject to fall within his proper sphere. At the same time he trains no neurologists. Oppenheim of Berlin, who was the foremost German neurological clinician before his death, had no clinic whatever and though he has trained many pupils, he left no successor. In Berlin every internist considers himself a neurologist and most surgeons are eager to operate upon the few neurological cases that are correctly diagnosed by those internists. It is impossible to accurately estimate the results but successful neurological operations are not numerous.

In Vienna a new Professor of Neurology and Psychiatry has just been elected to succeed Wagner-Yauregg. The latter is responsible for the malaria treatment of general paralysis. His work has evidently been of great value but he is obviously more interested in Psychiatry than Neurology.

Vienna is so flooded with foreign students that the professors in general seem to have little time for anything but didactic lectures. All foreign medical men tend to be classed by them with the individuals who come to listen to listen to their pronouncements. A professorship carries with it complete assurance of infallibility, an infallibility which has not always a firm foundation in fact. Such an attitude is particularly well illustrated in Professor Marburg. In spite of this the postgraduate teaching I saw was well done and it is obviously splendidly organized, due in large part to the local American Medical Association.

Arthur Schüller of Vienna holds some type of professorship of Neurology in the University. Although interested in Neurology, he actually confines himself to Roentgenography of the head. His knowledge and experience in such radiography is great and his enthusiasm unflagging. If he had adequate facility to work with encephalography and ventriculography as well he would have no equal as an X-ray diagnostician of cerebral conditions.

Professor Redlich of Vienna, an old assistant of Wagner-Yauregg, has a splendid service of neurological beds at Maria Theresa Schlüssel. He

has 110 beds containing both organic and functional cases and with a well organized polyclinic in the same building. He is beginning to do Neurohistology in his laboratory, somewhat as an amateur. He is an enthusiastic diagnostician and seems to have organized his assistants effectively. Denk is called in for any neurosurgery that is done.

Viktor von Weizsäcker holds the chair of Neurology at Heidelberg. There are only three ^{such} ~~kind~~ chairs in Germany, according to him. The other two are those of Nonne at Hamburg and Foerster in Breslau. Weizsäcker's department is a part of Internal Medicine. Psychiatry, on the other hand, is an independent department. His cases in need of surgical treatment are sent to the Surgical Department, and done there by various men. He has 60 beds on his service in the Akademisches Krankenhaus and three assistants. He has no interest in nor opportunity to study Neurohistology. His laboratory contains physiological apparatus capable of making various types of measurement and his assistant, Dr. Stein, does most of this sort of work. There seems to be little enthusiasm and no original points of view in this clinic. The mere creation of a department of Neurology does not seem to have improved upon the condition of affairs found in Berlin.

With regard to Neurology in Paris I have no right to venture an opinion. It is obvious that the successors of Marie and Dejerine (Guillain and Crouzon) are not the teachers that their masters were. Babinski has practically retired and it will be difficult indeed to find a successor of the same merit. Clovis Vincent, who is in Babinski's service at La Pitie, is making a real effort to carry out neurological therapy by a close and sympathetic association with the surgeon, De Martel.

Professor M. Nonne at Hamburg is head of the University Neurological Department and has a service of 260 beds at the city hospital, Eppendorfer Krankenhaus. He has a splendid assortment of material at his disposal here, both organic and functional, with some psychiatric cases as well. Nonne is a kindly though obviously an autocratic chief. He is doubtless an extremely good clinician. He has a histological laboratory where his first assistant, Dr. Pette, works on disseminated sclerosis and Dr. Schaltenbrand does some experimental pathological work. There is no routine examination of pathological specimens, however.

*Footnote-Dr. Goldsteiner of Frankfurt also holds a chair of Neurology, I believe

Professor Nonne will not permit intraspinal antiluetic therapy on his service and, in fact, permits lumbar puncture only in special cases, as in small children. Otherwise, spinal fluid is routinely obtained by the suboccipital puncture of Ayer with a degree of temerity that would make Ayer tremble. Nevertheless, Nonne believes there have been 10,000 such punctures on his service with only one death, that being from hemorrhage, but with 10 to 12 cases where there was evidence of the spinal cord having been struck. The advantage seems to be absence of post puncture headache.

With all this wealth of material there seems to be very little therapy. Malaria treatment is employed for tabetic pains as well as general paresis. The surgical therapy is carried out in the Surgical Department of the hospital and one of Nonne's aids acts as assistant. There seems to be no particular development of Neurosurgery. In general the clinic is obviously ~~xxxx~~ a good one but rather at a "stand-still".

Professor Jacob who has his pathological laboratory in connection with the department of Psychiatry is unfortunately in South America.

In many ways the clinic of Professor Brouwer in Amsterdam has the most complete neurological organization of any in Europe. Here ward and laboratory are interrelated in such a way that all assistants have some activity in both places. Furthermore, the plans of future clinic development include Neurosurgery as an integral part in it.

Professor Brouwer has a service of 120 beds in the Binnen-Gasthuys ^{huiss}
The Clinical Laboratory is situated between male and female wards and the Anatomical Research Laboratory is not far removed. From conversation with other neurologists I had understood that Brouwer, though a splendid anatomist, was deficient as a clinician. However, the clinical work seemed to be extremely well done. Whatever his ability as a diagnostician may be, there is more evidence of a well standardized neurological therapy here than in most clinics.

His assistants are given much responsibility. The chief of the Polyclinic and the chief of the ward service have each their own practice. The other three assistants are resident. There are also voluntary workers in the research laboratory. The patients are largely organic rather than functional. Syphilitic cases are put through the usual routine, including intravenous but not intraspinal salvarsan. Traumatic head injuries are

kept rigorously in bed for three weeks in all cases, though lumbar puncture is never done. The results are generally good. It is noticeable that traumatic head cases are not seen in most neurological services. Brouwer keeps patients suitable for teaching purposes as long as he wishes. One such patient has been fifteen years on the ward and another twenty five. Curiously enough, the latter patient, a case of multiple sclerosis, now has an hysterical fit whenever the students appear! Lipiodol and encephalography are used as in other clinics. Casual observation seems to indicate that the nursing is of a higher order here than in Germany or France.

The laboratory is an anatomical rather than a pathological one. Autopsy material is utilized but it is studied largely from the anatomical point of view. It may be that pathology will make its appearance with neurosurgery.

Brouwer's own research has been remarkably consistent and far-sighted. He has followed the visual pathway backward from the retina by a succession of concise experiments and has been able to set others to productive pieces of work along the way. The technic in his laboratory is not to be excelled for its kind. The sections are masterpieces.

In the new Hospital Clinic Neurosurgery will be embraced within the Department of Neurology. The surgeon, Dr. Oleyneck, is completing two years at Dr. Cushing's clinic. He will be given 5000 gilder yearly and allowed to send private patients into the service. Ward patients will be admitted to him only through the neurological service. After study here, however, he will be given, according to Dr. Brouwer, a free hand to examine and operate upon the appropriate cases as he thinks best. The incorporation of Neurosurgery with Neurology met with much opposition from other departments of the University, particularly Surgery. Dr. Brouwer told the authorities that Neurosurgery as done in the United States was much better as he had seen it with his own eyes and he must refuse to accept the French and German views on the subject of organization.

Dr. Brouwer really restricts himself to consultation in his private work. For treatment, his private patients are sent to one of his assistants. He is enabled to limit his work thus by a yearly salary of 10,000 gilder.

The distinctive feature of Brouwer's clinic is that stimulating scientific work is united with clinical work in a well organized unit. If

the neurosurgeon should prove capable of realizing his opportunity, adequate therapy will make the clinic truly complete.

To describe the clinic of Professor Foerster in Breslau as briefly as the other clinics requires a good deal of inhibition, as I have spent so much time here. Foerster was recently made Ordentlicher Professor of Neurology at Breslau, following an invitation to the chair of Neurology in Heidelberg. This offer he refused because he would have been forbidden to practise Neurosurgery. The creation of a chair at Breslau, however, did not carry with it a university clinic. There was already here an Ordentlicher Professorship of Neurology and Psychiatry occupied by R. Wollenberg, and with this chair a Clinic for nervous and mental cases.

Foerster has charge of a service in a city hospital, the Wenzel Hancke Krankenhaus, without University support. The 110 beds in this service are devoted to organic neurological cases, functional cases for the most part being sent elsewhere. There are four resident assistants in charge of the wards, one somewhat older Oberarzt, Dr. Schwab, a resident histopathologist who has begun to develop this much needed part of Neurology in a small laboratory, and a research assistant, Dr. Altenburger, who is interested in Neuro-physiology. None of these assistants has a practise. Foerster's private patients are in another hospital, the Charitas Heim, situated far from his clinic and particularly badly organized in that there is no resident staff and he must bring the assistants from the clinic for operations and must carry out the daily routine care himself.

Foerster's clinic is above all a clinic in which therapy takes first place. Syphilis of the central nervous system is treated energetically by the Swift-Ellis endolumbar method in addition to the other usual procedures. Intracarotid injections of salvarsanized serum are likewise freely used. Physio- and hydrotherapy are carried on vigorously in the special rooms which are well equipped for that purpose. The wards are pleasant but the nursing is not of the highest order and decubitus is too frequently seen.

Diagnosis is thorough. Encephalography is very frequently used and in the 1500 cases of spinal injection of air there seem to have been very few bad reactions. Direct ventriculography is also frequently used as well as lipiodal and the ventricular injection of dyes. Physiological diagnostic procedures also find a place here in a remarkably well equipped laboratory for chronaxie and other electrical measurements. These examina-

tions are carried out by Dr. Altenburger who is also studying the pituitary extract of cerebro-spinal fluid by biological methods.

The work of Foerster in Neurological Surgery will be taken up below under that heading. The scientific advances for which he is personally responsible are largely due to the opportunity afforded a neurologist in surgery. Practically all of his operating has been done under local anaesthesia. Thus he has used the patient as a witness to pain localization, has outlined areas of skin innervation and has determined the movements of the body which follow electrical stimulation of various areas of the cerebral cortex. This analysis of the cortical areas has made possible an intelligent advance in the treatment of epilepsy. His study of pain paths has made it possible to relieve certain types of pain more intelligently.

The members of this clinic are familiar with foreign literature as well as the local traditions. Foerster is the principal editor of the "Zeitschrift für die gesamte Neurologie und Psychiatrie". Above all, here Neurology is accompanied by therapy.

Neurohistology.

Professor W. Spielmeier of Munich is head of the Forschungsanstalt für Psychiatrie und Neurologie in Schwabing, a suburb of Munich. This Institute is largely devoted to neuropathology and histology. The splendid building and quiet surroundings as well as the pleasing personality of the director make this a most agreeable spot for study. Spielmeier is primarily interested in the pathology of the neurone and concerns himself little with pathological alterations in neuroglia. Because of its isolation there seems to be little direct connection with clinical problems and perhaps clinical points of view. Spielmeier's textbook of Neuropathology is a thoroughgoing attempt to cover the subject, and the views of the German School are well set forth.

There could be no better testimony to the stimulating atmosphere of Spielmeier's Laboratory than the fact that Dr. H. Spatz of Munich developed there. The latter is now head of the Laboratory in the University Psychiatric Clinic in Munich. He is young and enthusiastic and, like Spielmeier, seems to be openminded. His primary interest has been neuroglia and he differs somewhat ~~from~~ with certain of the Spanish histologists and

with some of my own views on neuroglia. Work in his laboratory is sure to be fundamentally productive, although he is at present a little too much bound by the traditions of Alzheimer.

Spatz is apparently already the accepted authority in Germany on neuroglia and he seems likely to succeed to the role played by Alzheimer in this respect, a role made easier by the German habit of recognizing accepted authorities. The work from his laboratory is sure to be of value although he is at present somewhat limited by the tradition of his school.

Professor O. Marburg of Vienna is a satisfactory teacher of neuropathology to beginners in the subject, - satisfactory to the beginners because he speaks as the final authority and presents subjects clearly. He is in charge of the Neurological Institute which is made up of large rooms on two floors and contains the beginnings of a good library. He has almost no financial support and little assistance. All work must be done by himself and his voluntary assistants. He is interested in clinical work and gives outpatient consultations on the service of Professor von Eiselsberg.

Marburg must be an indefatigable worker to judge from his literary production, and deserves much praise for his perseverance in the face of post bellum difficulties. Nevertheless, it must be said that he is not open-minded and does not understand some of the recent work in his field. His communications are full of assertions and crystalized opinions. His technique, so far as one can judge, is not very good. His work is profound without being critical, a contrast with the attitude in Munich. His is not a laboratory to be recommended for research.

Professor Oberling of Strassburg has been lately called to Paris. He is an histologist but not really a neurohistologist. He has described ~~many~~^{certain} tumors of the meninges without careful study of the embryology.

Professor G. Roussey of Paris has a charming personality and a large and well-equipped laboratory. Like many French histologists, he is interested in description of pathological cases, without ever having made a patient fundamental study of the embryology and nature of the cell types concerned. This attitude applies evidently to others who have worked in his laboratory, to judge from their publications.

Professor J. Nageotte of the College de France holds the chair of Comparative Histology. His work has been largely upon peripheral nerves,

however. Old, very deaf and somewhat infirm, he is nevertheless fired with enthusiasm in his work and is mentally alert, still pursuing the subject of his earlier discussions with Cajal upon the peripheral nerve. There is much to be learned in his laboratory in this particular field. He does not go into pathology.

Professor M. Hovelacque in the Laboratoire d' Anatomie, Ecole de Medicine, is not a histologist but a gross anatomist of a type that is now rather rare. He has a profound knowledge of the gross anatomy of the peripheral and sympathetic nervous system as evidenced by his splendid book on that subject. He is an enthusiast in the dissecting room and I know no laboratory where the gross anatomy of the nerves could be so well and pleasantly studied.

The work of Professor Brouwer in Amsterdam has already been mentioned. His work has been anatomical histology splendidly done and closely related to human physiological problems.

Professor Phillip Stöhr of the University of Bonn is, like Nageotte, an histological anatomist with no clinical or pathological interests. His work upon the microscopical anatomy of the sympathetic nervous system and the innervation of the pia mater and blood vessels is important. He is an excellent technician, young, enthusiastic and critical. He would be an excellent man to work with, though for the moment he is studying the development of the vascular system.

Professor M. Bielschowsky of Berlin has long been in Germany the accepted authority on the finer structure of nerve cells, thanks to the use of his own silver method for staining these cells. He has a small laboratory with one technician in the top floor of the Kaiser Wilhelm Institute für Hirnforschung of which Oscar Vogt is the chief. He carries on his own private practice in neurology but has no clinic affiliations. His work has always thorough and original. He is primarily a cytologist but has worked long upon such pathological specimens as are sent to him. His relationship to Vogt has for many years been that of symbiosis with tolerable friction. Bielschowsky, though he has always worked quietly, is too much aware of his international standing to play "second fiddle" gracefully.

He cannot be said to be either an experienced neurologist nor a well rounded neuropathologist, but he stands in the front rank of neuro-

histologists and is a splendid technician. His laboratory is a good place for a serious worker to study the finer structure of nerve cells.

Professor Oscar Vogt is a unique figure in Neurohistology. A man of profound learning, very critical of all investigation including his own, demanding perfection in technique and unfaltering diligence from all associated with him, he has created a remarkable institute for the study of cerebral architectonic. The fourteen assistants and technicians have each their own special field. Vogt is entomologist as well as neurohistologist and has three assistants mounting various types of insects of which he has already over one million specimens arranged in rows, companies, and regiments, each limb and feeler posed in identical attitudes so that a glance at those glistening backs shows one the various changes of color and shape which an individual species presents in different areas of this and other continents. This collection is not confined to the laboratory but has found its way into two rooms of his apartment, and some of the finest specimens are to be found behind the wooden doors of the tall cupboards that shoulder each other about his living room.

However, entomology is for Vogt only a hobby. He is Director of the Kaiser Wilhelm Institute für Hirnsforschung. A new Institute will be ready for occupancy in a few months. He will then have associated with the Laboratory a limited number of beds for neurological cases of any type that it is desired to study. He also expects to have further assistants, particularly one well trained in physiology.

Cerebral architectonic, which Vogt is studying, includes the structural relationships of the nerve cells in all parts of the brain. Brodmann, a former assistant of his, has written a book upon this subject. Professor von Economo has also published exhaustive charts of brain areas. But Vogt will never be satisfied until he has mapped out the pattern of nerve cells in every area of the brain and made an attempt to name the function to which these different patterns are devoted.

Two incidents will illustrate the direction of his thought. He drew up an outline of the cell pattern areas as he conceived them on the surface of the brain and sent it in a letter to Professor Foerster, asking him whether or not these areas corresponded to the areas which Foerster was

outlining upon the human cerebral cortex by electrical stimulation.

Curiously enough, Foerster was at the same time writing a letter to Vogt with a similar request. On Foerster's brain outline were sketched the areas of the so-called motor cortex, but also the areas on the rest of the cortex from which stimulation produced well coordinated movements of the patient's body. The two letters crossed in the mail and the two diagrams corresponded to an astonishing extent. Thus Vogt had more names for function to attach to his patterns.

The second incident has to do with the brain of Lenine. Vogt was summoned by the Russian Government to examine the brain of the dead leader. Before he returned to Berlin with the specimen he was asked what he expected to find. He said~~th~~^{be} that there would probably a very well developed third cortical ~~layer~~ nerve cell layer. Sections of this brain do show a remarkable development of this layer, and sections of criminals with low grade mentality in Vogt's collection seem to show under- development of the same layer.

To prepare one brain for such study requires the exclusive work of one technician for one year and costs about 14,000 marks in material and labor. Sections are cut through the whole brain and every fifth section is kept, and so large a photographic print is made that the cells stained by Nissl's method are easily studied without reference to the slides. Three of the technicians have been with Vogt for twenty years. Two assistants do nothing but photograph sections. The preparations are literally crowding them out and into the new Institute.

Dr. Cecile Vogt, the wife of Otto Vogt, is a French woman who also works in the Institute. She has done work of great importance. Their publications have usually appeared jointly as from O. and O. Vogt. Their work on diseases involving the basal ganglia is of great importance in clinical neurology and neurophysiology. She has maintained independence of thought in the presence of so compelling a personality as her husband. The daughter, an only child, has likewise begun to work on cerebral architectonic. Both Otto and Cecile Vogt have a private practise and do just enough to supply their financial necessities. Dr. M. Rose is first assistant in the Institute and manages the publication of the Journal für Psychologie und Neurologie, of which the two Vogts are the remaining editors.

The Institute under Otto Vogt is a most remarkable example of well

organized scientific investigation. To copy such an organization would, however, be futile for the personality of the Vogts could not be transplanted and without it their organization would be sterile.

Neuro-Surgeons.

If the term neurosurgeon were taken here to describe those men who limit their surgical work to neurology the list of neurosurgeons on the continent of Europe would be reduced, I believe, to two men, Foerster and Pusepp, both of whom were primarily neurologists. + Magnus

The first men in Europe to venture into neurosurgery were Krause of Berlin and von Eiselsberg of Vienna. They began their work under the pioneering stimulus of Horsley in London and Mac Ewen in Glasgow. Krause has now retired. Von Eiselsberg is still Professor of Surgery at Vienna.

When I asked Professor von Eiselsberg if I might see him do some neurosurgery, he waved his hand and said, "You had better go to CushingHis results are better than mine because he makes his own diagnosis I never do neurological cases when I can avoid them. Come and see me remove a stomach tomorrow at eight." One of von Eiselsberg's assistants spent a year with Dr. Cushing. Nevertheless, most of the neurosurgery in Vienna is now done by a former assistant of von Eiselsberg, Dr. Denk.

Professor W. Denk does general surgery but is called by various various neurologists to operate upon "their neurosurgical cases". He is a rapid, rough, precise operator, with little or no interest in neurology.

More stimulating neurosurgical work in Vienna is being done by a rhinologist, Professor Oscar Hirsch, who takes the pituitary into his field. He was the first to operate upon the pituitary through the nose, though Cushing has subsequently taken it up. Hirsch has continued his work with much success but little or no publicity. I saw him remove a tumor of the pituitary, thus saving the eye-sight of his patient, in one hour. The patient sat in a chair, under local anaesthesia, and held a basin for the operator. She then walked back to the ward and went to bed. This was rather a startling contrast to the elaborate ritual that attends Cushing's use of the method under general anaesthesia.

Hirsch publishes rarely. His mortality is, however, very low and his results uniformly good. He applies radium through the nose to the

tumors after operation. Those cases of pituitary tumor which present above the sella he is of course unable to treat, not being trained for intracranial approach to this region. The surgery of the sella obviously belongs in the field of neurosurgery but too many neurosurgeons elect the more dangerous intracranial approach because of their lack of familiarity with the nasal cavity. In the general indecision between neurologists, rhinologists and neurosurgeons, efficient treatment of pituitary tumors has often been impossible, even when so good a rhinologist as Dr. Hirsch is available.

The pioneer in neurosurgery in France is Dr. T. de Martel who has reproduced neurosurgical technique there without giving up his broad general surgical activity. He is technically very clever and gives a dramatic operative clinic. He operates in his own hospital at 219 rue Vereingetorix without University affiliation. He is closely associated in his neurosurgical work now with the neurologist Clovis-Vincent, who also acts as his operative assistant.

De Martel, in his address before the Paris Neurological Society this year, described his earliest operations on brain cases as rapid and brilliant but invariably followed by death. He consulted Horsley who told him such operations must never be rapid. Thereupon De Martel operated less brilliantly and his patients began to live. Now however, he said, he has gone as far as a general surgeon can go with neurosurgery. Now must Clovis-Vincent himself begin to operate.

De Martel is interested in devising new instruments but seems to lack a grasp of the problem important to the individual patient. Most of the operations I have seen him perform have been well executed but have missed their goal. Nevertheless, he deserves great credit for being able, single-handed to achieve success in neurosurgery without institutional or University backing. He has had to pay for the time consumed and the expensive equipment involved in neurosurgery from the proceeds of simpler forms of surgery.

Rene Leriche, professor of Surgery at Strassbourg, may perhaps also be called a neurosurgeon. He recognizes no limitations to the field of general surgery and considers the central nervous system part of his proper province; but his real field of activity has been the sympathetic nervous system and vascular surgery.

He is chiefly known because of the operation of periarterial

sympathectomy, which he devised, a procedure which is occasionally of unquestionable value. Its sphere of usefulness is less, however, than was at first supposed and he himself is much more conservative in its application than he was at the time of my visit to him in Lyons in 1924.

He is concerned with the anatomy of the sympathetic and he spins its physiology from clinical findings. He has little knowledge of pathology. It must be admitted that at times his reasoning is paradoxical and even self contradictory, but he is a brilliant opportunist and empiricist, a good surgeon and a keen observer and evidently stimulating to the group of young men gathered about him.

He has discovered that section of the cervical sympathetic, producing as it does a ptosis, is of great help in paralysis of the facial nerve where the eye cannot be otherwise voluntarily closed. He has concluded that reflex vaso-dilatation such as occurs, he feels, in traumatic decalcification can be remedied by sympathectomy just the same as the opposite condition of reflex vasoconstriction.

The experimental physiology being done by Fontaine and other assistants in his Laboratory is in need of critical analysis which he does not seem to be able to provide. He himself feels that the future of the surgery of the sympathetic nervous system depends upon its coordination with neurology in general and that it will form a very large part of neurological surgery.

Dr. Paul Martin, a surgeon in Brussels, has brought to that city experience learned in Cushing's clinic and a determination to do good neurological surgery. There is here no chair of Neurology. L. van Bogaert is a neurologist attached to medicine. Ley, Professor of Psychiatry, has little interest in Neurology. Martin states that practitioners of medicine do not hesitate to call him in to consult upon neurological cases although to call in van Bogaert or Bremer or another "medical" neurologist would seem to them admission of their self evident neurological ignorance. Martin does not consider himself a neurologist.

Dr. F. Bränning of Berlin is a surgeon interested in surgery of the sympathetic nervous system. He lacks the brilliance of Leriche and is only a tolerable operator. I must confess not to have read his book upon the subject.

Professor O. Foerster of Breslau has already been spoken of at some length under Neurology. For years he acted as assistant to the surgeon whom he called in to operate upon his own cases. At length he determined to dispense with the operator and do it all himself. This he did shortly before the war. With the coming of the war he was put in charge of a large neurological hospital and did all of his own operating. In taking over surgical therapy he began to carry out all procedures needed by the neurological patients, i.e., such orthopedic procedures as have to do with tendon surgery in addition to what is usually called neurological surgery.

His operative technique at present differs greatly, as might be expected, from that of American neurosurgeons. It resembles more the manner of operating of Horsley and Sargent in England. He is a slow painstaking operator who uses no bone wax, no silver clips for blood vessels, no suction in the operative field, makes no osteoplastic cranial flaps and closes the scalp in a manner not sanctioned by the school of Cushing. He tolerates little help from his assistants and his nurse stands behind him handing what is needed awkwardly over his shoulder. Nevertheless, his surgery is good. He shows the greatest respect for tissue in general and the brain in particular. He is radical, even brilliant, in the removal of tumors and daring when occasion demands. Wound closure is meticulous and wound healing on the whole good.

There are certain operations which are better done elsewhere. There are numerous technical devices which Foerster could use to the advantage of both himself and the patient. ~~In general his diagnosis is accurate, his treatment radical, and his results good. In focal epilepsy his fearless radical excisions of the scarred brain area marks a step forward in the treatment of this scourge. So far as my experience goes neurosurgery in this clinic is unequalled outside of the United States and such a well balanced combination of sound neurology and neuro-~~

The craniotomy patients later bear large cranial defects and the scars may not be well hidden. Moreover, in his almost universal use of local anaesthesia, the patients sometimes suffer acutely, although it must be admitted that the mortality is thereby probably lowered. In general the diagnosis is accurate, the treatment radical and the results good. In focal epilepsy his fearless radical excisions of the scarred brain area marks a step forward in the treatment of this scourge. So far as my experience goes neurosurgery in this clinic is unequalled outside of the United States and such a well balanced combination of sound neurology and neuro-

surgery is to be found nowhere. The complete lack of neuropathology in this clinic is its greatest drawback.

Discussion.

From the care of the neurologist have been taken away many of those ailments which are now susceptible of cure by modern methods. Thus, treatment of epidemic cerebro-spinal meningitis is carried out in internal medicine, where there is familiarity with serum treatment. Poliomyelitis also is to some extent become the province of the serologist and even syphilis of the central nervous system. Orthopedic surgery has largely taken over the treatment of spastic paralysis. It is chiefly those diseases for which adequate therapy is lacking which are left undisputed in the province of Neurology.

Tumors of the nervous system, because their diagnosis requires much specialized knowledge, have continued to belong to the neurologist, but with the increased efficiency of neurosurgery in the United States, the neurologist has already sometimes been set aside even for these cases.

For the so-called functional neurological cases there has also been developed a therapy sometimes adequate and often inadequate, but nevertheless therapy. It includes psycho-analysis, child welfare work, hypnosis, gland therapy, etc. Many neurologists have entered this field and for the most part lost touch with organic neurology. Many psychiatrists have come into the field of neurosis but have brought little interest in organic neurology.

In the presence of this partial dismemberment of neurology during the past thirty years it is perhaps not surprising to find so few centers of neurological thought in Europe. The German Universities have, for the most part, created chairs of Neurology and Psychiatry but the occupants have proved to be interested in psychiatry rather than organic neurology. At present one searches in vain for great teachers of neurology such as Erb and Oppenheim in Germany and Charcot, Marie and Dejerine in France.

Of the neurological clinics which I have visited, three stand out

and care of the organic neurological cases which are not and those which are susceptible of surgical attack requires the same clinical and pathological training. Those neurosurgeons in the United States who have taken up this speciality without neurological training are gradually becoming neurologists, thanks to the fact that they are enabled by the circumstances of professional and university life in that country to restrict their work to neurological cases.

The growth of neurosurgery in the United States during the past twenty years, the lack of development of neurology during that period and its failure to become established as a well recognized unit in university teaching both point toward the fact that neurology and neurosurgery should combine, a fact that ~~that~~ is already theoretically obvious, as neurosurgery is blind without neurology and can hope to make no advance, and neurology ineffective without surgery. The preliminary training for the personnel of such clinics must be in neurology, surgery, and neuropathology. Neurosurgery obviously cannot be well done by a surgeon not devoting his entire time to that speciality. That seems well demonstrated by the condition of neurosurgery in Europe at present, and even in such large centers of population as Berlin and Vienna where Krause and von Eiselsberg have attempted it.

In the ideal neurological clinic which would include surgery and adequate histopathology, what shall be the boundary line between it and psychiatry? Obviously, there can be no hard and fast line. The two specialties must overlap on the milder functional cases and they must both interest themselves in the study of the brain. Foerster, whose preliminary training would have fitted him as well for psychiatry as neurology sends away the purely mental cases and confines himself largely to the demonstrably organic. The same is true also in Brouwer's clinic.

My personal conclusion is that the division, which can never be hard and fast, must eventually fall between organic and functional. The mental and functional cases then would be treated by men skilled in psychotherapy and conversant with existing social conditions. It may be of course that some of these cases will be found to be organic some day, which is the strongest argument for complete facility for neurhistology in psychiatric departments.

The combined neurologist and neurosurgeon, because he is capable

of administering the therapy will also naturally have the organic neurological cases under his care. There may be two neurologists only one of whom operates but there should never be a neurologist and a surgeon ignorant of neurology. The relationship must depend on personalities. The argument that neurology ~~xxxx~~ must be part of medicine and that neurosurgery must be an integral part of surgery, if adhered to, will eventually end in the development of neurosurgery and the disappearance of neurology on the principle that therapy determines the care of patients. Medicine will then call in two consultants, the psychiatrist and the neurosurgeon who, incidentally, will have become neurologist as well. The combination of neurology and psychiatry without surgery has tended to result in the disappearance of interest ~~in organic~~ in organic neurology, at least in Germany and Austria. *paradoxically*

Certainly nowhere are there more problems remaining to be solved than are presented by the maladies that affect the nervous system and the mind. No arrangement will ever be adequate to solve these questions, which does not ignore the artificial partitions of Medicine, Surgery and Pathology. The Pathological Department which takes to itself the autopsy material, and the Surgical Department which bars the neurologist, put almost insurmountable difficulties in the way of the solution of these problems. The neurologist must be familiar with medicine and he must have general surgical training. The preparation is long and there are no short cuts.

Give to psychiatry neurohistology and the means of mental therapy and to neurology neuropathology and complete facility for surgical therapy. Let them be ^{as} closely associated with medicine and surgery, as is possible in hospital life, but allow them complete facility for experimental and therapeutic study of their own problems. Then we can hope for solution of some of the riddles presented by the sufferers from nervous and mental diseases.