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NEUROVASCULAR SURGERY

SPECIALIZED NEUROSURGICAL TECHNIQUES

Edited by

F. Marguth M. Brock E. Kazner

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Neurovascular Surgery

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Opening Oration

F. MARGUTH

I should like to welcome all of you wholeheartedly to the Joint Meeting of the American Academy of Neurological Surgery and the Deutsche Gesellschaft für Neurochirurgie. I welcome especially our colleagues from the United States and the ladies.

This event is a historical one for the very special reason that, for the first time in the history of our field, an American and a German society are holding a joint congress. This does not mean that contacts between American and German colleagues are new. On the contrary, this congress is the result and expression of relationships that have existed for many years, through international and national meetings, as well as of exchanged visits.

The interaction between American and German developments in the field of medicine reaches back to the middle of the last century. First it was the German medical scene that had a strong influence on developments in America, until the turn of the century. Then this situation was reversed. Prior to, and especially after, the second World War strong American impulses and innovations were influential in the whole field of German medicine.



WILHELM TÖNNIS, 1898–1978

As concerns neurosurgery, HARVEY CUSHING and WALTER DANDY laid the foundation for a systematic and world-wide development. Their scientific findings are still of value today. This meeting also provides a special occasion to look back to the development of German neurosurgery.

On September 12, 1978 WILHELM TÖNNIS died, only a few months after having celebrated his 80th birthday. His name, the development of German neurosurgery and our society are closely interwoven. There is hardly any action that does not also carry his initials.

WILHELM TÖNNIS was born in Dortmund-Kley in Westphalia. He received his medical degree in 1922/1923 and presented his doctoral thesis in 1924. He became Dozent in 1929 in Würzburg. His surgical teacher supported his wish to devote himself to the field of neurosurgery. TÖNNIS was awarded a Rockefeller grant so that in 1932 he could start to specialize in neurosurgery with HERBERT OLIVECRONA at the Karolinska Institute in Stockholm. He then inaugurated the first neurosurgical department in Würzburg. In 1937 he was appointed to the first university chair of neurosurgery in Berlin, where he was able to start an ideal connection between clinical work and brain research. Thereafter he obtained the chairmanship of the Department of Brain Research and Experimental Pathology at the Kaiser-Wilhelm Institute, later to become the Max-Planck Institute. In 1936 TÖNNIS founded the "Zentralblatt für Neurochirurgie" edited by JOHANN AMBROSIUS BARTH in Leipzig, the first neurosurgical journal ever published. The organization of the treatment of brain and spinal cord injuries during the second World War by TÖNNIS is still basically valid and constitutes an excellent example, beginning with first aid and ending in rehabilitation. After the second World War, he started the rebuilding program at the Knappschafts Krankenhaus in Bochum-Langendreer, again as a general surgeon with a department of neurosurgery. In 1948 TÖNNIS obtained the first postwar chair of neurosurgery in Germany, founded by the Medical Faculty of the University of Cologne. In the following years he wrote many scientific papers, gathering his experience in the HANDBUCH FÜR NEUROCHIRURGIE (edited by him and OLIVECRONA). At the same time he completed his clinical and operative developments. Of paramount importance are his works on clinical management and diagnosis of brain tumors, vascular malformations of the brain, and on the pathophysiology of cerebral blood flow and intracranial pressure.

Neuroradiology also benefited from decisive impulses coming from WILHELM TÖNNIS. He is responsible for the creation of neurosurgical departments and chairs in 24 other German and foreign universities. In 1970 TÖNNIS created the foundation that bears his name and provides grants to young neurosurgeons to aid their training in foreign centers. His testament gives further support to this foundation.

His membership in 21 national and international societies, the fact that he was awarded a title of doctor honoris causa four times, as well as the OTFRID FOERSTER, the ERB, the HARVEY CUSHING, the PARACELUS, and WALTER POPPELREUTER medals, and that he received the "Große Bundesverdienstkreuz mit Stern" show the great recognition of his work as a pioneer in German neurosurgery. In 1950 TÖNNIS proposed the creation of the FEDOR KRAUSE and of the OTFRID FOERSTER Lectures. Among other things, TÖNNIS wrote: "What has German neurosurgery done?" Certainly, for all of us, at the beginning stands the person and personality of HARVEY CUSHING, to whom we are grateful for having given us, through his systematic life-long work, fundamental knowledge about the operative

treatment of brain tumors. The outstanding importance of HARVEY CUSHING is by no means minimized if we point out that prior to him, and at the same time, other pioneers were active in contributing essentials to our field, and to whom we all are also grateful. Therefore, the names of three German physicians should be remembered by every German neurosurgeon: ERNST VON BERGMANN, FEDOR KRAUSE, and OTFRID FOERSTER. The invitation to such a lecture IN MEMORIAM represents the greatest honor our society has to offer a colleague.

In honoring others, it honors itself by remembering the words of HANS SACHS:

“Ehret Eure großen Meister,
dann bannt Ihr gute Geister”.

Having said this, we should like to pay tribute to the memory of WILHELM TÖNNIS, who deserves great gratitude on the part of German neurosurgery.

He had a clear vision for the essential facts. He **challenged and promoted** his colleagues and students. For his patients he was a physician as well as **an aid** in difficult times.

I should like to ask you now to honor WILHELM TÖNNIS, the great surgeon, with a standing ovation.

What a long way our field has gone since its beginnings! The rapid progress in basic sciences and technology was of decisive benefit. Let us review only the last 10 years: What great possibilities have been given to us by the operative microscope and by computer tomography. Neurosurgery of today, although recognized world-wide as an independent special field, is in danger of being fragmented. Certainly, activities and research programs concentrating on a limited field of activities have led again and again to new knowledge and talents, but they should remain under one roof and under one guiding chairmanship, integrating everything that goes together with the operative treatment of diseases of the central and peripheral nervous system, since the problems and the experiences of the different subspecialties overlap. They could lead to a fruitful and stimulating interaction. My concerned thoughts also include the fact that large operational needs for personnel and equipment do not make it recommendable to establish small departments, as experience seems to show.

We have arranged this meeting together with the American Academy (and hopefully are planning more meetings) to strengthen contacts. We are convinced that scientific discussions within a smaller framework as well as the exchange of personal points of view are very beneficial. Therefore, it is understandable that our program does not have a main subject but consists of a colorful presentation of different scientific and clinical problems.

Additionally to the exchange of scientific thoughts, we wish to show you a small part of our country. We should like you to get to know Munich and its countryside, and we gladly took efforts to arrange a program that will hopefully please you. Arriving in a foreign country, you are probably touched, and feel at home, by things and persons coming from your own homeland. This, too, we can offer you, namely two Americans. One from the past and one from the present. The name of the first is Mr. BENJAMIN THOMPSON. At the end of the eighteenth century he arrived at the royal courts of Munich and made a big career, there, under the reign of Kurfürst KARL THEODOR. In 1790 he **abolished begging** and provided occupation and food for the beggars. On his suggestion, a **large park** was built for the

people: the English Garden of today, in the northern part of Munich. Sir BENJAMIN THOMPSON, Count of RUMFORD, also invented a special kind of potato soup. It carries his name: Rumford soup. Finally, he suggested the demolition of the walls and fences around the city.

The other American is sitting right among us. He stems from an old aristocratic Bohemian family, is an American citizen, and comes from the University of Notre Dame. He is Professor Dr. NIKOLAUS LOBKOWICZ, the president of the Ludwig-Maximilians University of Munich. In contrast to Mr. THOMPSON, he provided strong support for the walls protecting the University of Munich against attacks on the part of the government and **permitting** the University to defend itself against destructive political actions, for the **preservation** of the freedom of science and teaching.

Some Thoughts About the Future of Neurological Surgery

A. A. WARD, JR.

This joint meeting of the American Academy of Neurological Surgery and the Deutsche Gesellschaft für Neurochirurgie is a memorable occasion. For the benefit of our German hosts, I might make a few comments about the Academy. This is not a conventional professional organization. It has always had a limited membership and has always had more of the attributes of a large family than an organization. We would like to think that our membership encompasses the leadership of neurosurgery in North America. Perhaps more importantly, we are all good friends. We know each other well, and we know each other's families. We feel free to discuss matters among ourselves that we would not discuss in a more public forum. We feel free to make demands on each other that we would not make of other colleagues. It is an intellectual family. For these reasons you can understand why it is a particular honor to have the opportunity to serve this group. The honor is magnified this year since I have been given the opportunity to serve at a time when we meet jointly with one of the most renowned neurosurgical societies in the world. So, at the commencement of this joint meeting, I would like to express our thanks to our German hosts for the privilege of meeting with you.

It is useful, from time to time, for a profession to step back and view its current progress in a broad perspective. Neurosurgery is a new specialty that is barely 50 years old. It evolved with phenomenal success, and its initial growth was spectacular. Among surgical disciplines, we were considered the "Queen of the Arts". However, in recent years, there is a growing perception that the major excitement has left the field. We have been displaced by other areas of rapid progress such as open heart surgery, organ transplant, etc. We are becoming just another surgical speciality. Although the therapeutic horizons of our field continue to enlarge, it might be hard to document that there have been significant advances in our therapy of brain tumors, herniated disk, and trauma of the nervous system as compared to what the discipline provided 30 years ago.

A cynic might say that neurosurgery has developed into a mundane, routine field relegated to delivering standardized surgical treatment to the public, perhaps analogous to the current status of abdominal surgery. Certainly we need surgeons to carry out appendectomies and to remove gallbladders, and we will need neurosurgeons to remove brain tumors and subdural hematomas. If we are to be satisfied with such a role, a major opportunity will have been lost.

At this point in time when the momentum of progress in neurosurgery is faltering, it is ironic that the broad field of neuroscience is now just coming into full flower. There is, at this time, more intellectual excitement and potential in neuroscience than any field of biolo-

gic research. Some 2 years ago, the President of the United States appointed a Presidential Biomedical Research Panel, and I would like to quote one of their key recommendations:

Perhaps the ultimate challenge to biomedical research, representing the very pinnacle of our understanding of the human organism, lies in neurobiology: how the brain and nervous system develop, how they function in health and disease, how thought occurs, how memory is stored, how we reason, how we are motivated, and how we interact with our physical and social environment . . . The study of brain and mind deserves greatly increased attention not only in the programs of the Federal Government, but also from the many different disciplines of biomedical and behavioral sciences . . . This Panel commends neurobiology as a compelling long-range interest worthy of national attention.

This is high praise and it comes from a group of scientists, clinicians, and experts from all fields. This potential is well-recognized by our young people. Neuroscience is attracting the bright young brains who have interests in biomedical research, but how can neurosurgery be a part of this new adventure? It will not occur without involvement by our discipline and not without some changes. We cannot place all the responsibility for progress on our colleagues who are Ph. D. scientists. Clinicians must be involved in the process. The future answers will be slow to evolve without access to the experiments of nature as they occur in human disease. The field of neurosurgery must play an active role in this process.

What needs to be done? We need the right people and the right environment. An old German recipe on how to make *hasenpfeffer* begins "First you must catch the right rabbit". We must attract the young people into our discipline with the right motivations and goals, and we must then provide the unusually talented individuals with an environment where they can be productive. They must have an opportunity to interact with a spectrum of research scientists. They must be shielded from nonproductive activities. We must make it possible for them to obtain support for their research. If they are clinicians, they must be protected from an overwhelming clinical load that saps their time and innovative energies. Academic centers in the United States have been making progress in the past in recruiting some such individuals and providing them with the necessary environment where research is possible. I am sorry to say that this effort is currently declining. In Germany, it has not been the custom for neurosurgical centers to develop along these lines. In contrast to America, I am happy to see that you are building greater momentum in the direction of providing research training and opportunities for young people. However, as you can judge better than I, some fundamental changes in the structure and function of neurosurgical centers will be necessary before major progress along these lines is possible. Such an effort is expensive. It requires more manpower and more facilities. The health care system as well as the profession must support such changes. We need research that is ultimately relevant to man. This is essential if the future viability of neurosurgery is to be assured.

The history of significant advances in other fields clearly shows that a broad base of knowledge is necessary upon which to build clinical advances. Open heart surgery is such an example. It is hardly accidental that GIBBON began his long research program on a heart-lung machine in 1934 – the very year that heparin became commercially available. Furthermore, it is important to remember that GIBBON spent 13 years trying to perfect the heart-lung machine, not for open heart surgery, but to allow time for a surgeon to remove an embolus blocking the pulmonary artery. It was only in 1947 that, on the urging of ALFRED BLALOCK (of blue baby fame), he switched his goal to providing an instrument that would permit the repair of cardiac defects. We in neurosurgery are also dependent on a broad base of innovative research, and we must have clinicians involved in the research

process to guide and extend the research effort into areas relevant to human problems. Most importantly, we must have active clinicians interfacing with the research efforts so that, like BLOLOCK, we can identify the clinical potential of new knowledge. Otherwise it will not occur.

Once a body of knowledge has accumulated that leads to a potential new therapeutic approach, we must devise better methods for clinical trial. In the past, this process has been haphazard, inefficient and, at times, dangerous to the public.

The development of portocaval shunts is a lesson that we can hopefully avoid. The first experimental portocaval shunts were carried out in animals in 1877, but attempts to apply the procedure in patients resulted in no long-term survivors and the procedure fell into disuse. It was reintroduced for the treatment of esophageal varices in patients suffering from cirrhosis of the liver by WHIPPLE in 1945. Soon after, the apparent success of the operation was such that it was many years before the value of the procedure came into serious question. It was not until 1954 that it was recognized that portal systemic shunt in man is often followed by a severe intermittent encephalopathy – now recognized to be related to alterations of amine metabolism in brain. For these reasons, undertaking the operation for prophylactic reasons was discredited, and by now, the value of therapeutic shunts in patients who had already bled from varices is being questioned. From this brief history, it is obvious that at least 30 years were wasted by the failure to introduce standardized or randomized clinical trials from the beginning.

We have had similar experiences in neurosurgery. Aneurysm surgery was well-established before an effort was made to objectively determine the therapeutic effectiveness of the operation as compared to the natural history of this condition. A similar situation is developing with respect to the extracranial-intracranial bypass graft operation for occlusive disease of intracranial vessels. The National Institute of Health in the United States has sponsored a controlled study to determine the efficacy of this procedure, but already the operation is becoming so popular that it may be too late to undertake an appropriate study of this kind. We may be in the same position as the field of cardiac surgery and the coronary bypass operation that they have developed. The surgeons are enthusiastic about their clinical results, and the operation is popular with the public, but there is still no firm evidence that this cardiac operation prolongs life.

I think the time is past when new therapeutic approaches can be developed and utilized in the haphazard way that has been the custom in the past. Appropriate techniques are available for safely developing new procedures and instituting controlled clinical trials. We know what to do. Furthermore, the public is also aware that operations can be developed with appropriate safety and that they should be carefully evaluated by clinical trials before they are generally adopted. If the neurosurgical profession does not undertake this task, I suspect that society will do so. This will, however, involve the known inefficiencies and burdens of governmental involvement. It is our obligation to the public to improve our capability to help the sick and suffering and to do so in a safe, responsible, and accountable way.

Thus, I would propose that the field of neurological surgery has an exciting future as a part of the rapidly expanding field of neuroscience, but we must make some effort to plan our destiny.

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