Viewpoint: Crisis in German Academic Medicine

Loss of Almost a Generation of Talented Researchers

The career incentives for clinician–scientists have received much criticism in recent years in Germany, causing the loss of almost a generation of talented researchers in the country. As a result, Gerd Heusch, MD, PhD, FRCP, president of the German Cardiac Society, launched a counterattack earlier this year with an advertisement in a national newspaper, followed by meetings with trade unions and politicians.

Back in 2006, Desmond Sheridan, MD, PhD, MRCP, professor of cardiology at St Mary’s Hospital and Imperial College Faculty of Medicine, London, United Kingdom, in an interview with Circulation: European Perspectives in Cardiology, highlighted the almost universal decline in European academic cardiology and the threat to innovation this posed.1 He said, “I would be hard pressed to think of any country in Europe that is dealing with this problem without difficulty.”

Professor Heusch believes that these words particularly apply to his own country of Germany. He started his 2-year term of office in April 2007, and he says that during his presidency he aims to create or restore the incentives for young doctors to work as clinician–scientists, thus safeguarding the nation’s reputation for excellence in research and innovation. He says, “I have made that a priority to work on as much as I can.”

“Germany Has a Good Number of Established Leading Researchers Right Now”

At present, Germany has a prominent reputation for its cardiovascular research (Figure 1). Professor Heusch comments, “I can say with some pride that Germany has a good number of established leading researchers right now. It is at the forefront of countries having talented cardiovascular clinician–scientists, along with the United Kingdom and the United States.”

The research fields in which German cardiovascular scientists particularly excel include cell-based myocardial repair (most notably with adult stem cells), mechanisms of myocardial ischaemia/reperfusion injury and protection by...
pre- and postconditioning, genetics of cardiovascular disease, and innovative technology such as absorbable stents or coated angioplasty balloons. But many of the researchers who have earned this international respect are more than 50 years old.

“IT IS ALMOST AS IF THE ENTIRE SYSTEM WERE DESIGNED NOW TO DESTROY THE ENTHUSIASM OF SOMEONE CONSIDERING ENTERING A SCIENTIFIC CAREER IN CARDIOLOGY”

Because of the massive disincentives to careers in academic medicine in Germany, the country is losing a generation of clinician–scientists, and it will have difficulty remaining at the forefront of research and innovation in the future.

Once, Germany represented a European stronghold for the development of talented clinician–scientists. Professor Heusch says, “The tradition was that for the first 2 or 3 years after graduating from medical school, a doctor would be expected to spend time in a physiology, pharmacology, or pathology laboratory, learning experimental research in that particular basic cardiovascular field. The doctor would get socialised into the scientific environment and learn how to work as a scientist. He or she would write 2 or 3 papers during that time and then go on into cardiology. Having been socialised by this basic science background, it was fairly easy to do some basic research in parallel with caring for patients—and translate what you had done in basic science to a clinical problem.”

However, that has changed. He says, “The young doctors now go right into clinical medicine. We are having increasing difficulties recruiting youngsters for even a short time to a basic science department.”

The traditional system existed, more or less, from after World War II until about 10 to 15 years ago. But drastic changes in law and regulations in recent years especially have contributed to the process of destroying a system that once encouraged clinicians and clinician–scientists relatively equally. Indeed, the present system has disincentives working on professors at the top of the career structure right down to those considering careers in academic medicine.

Says Professor Heusch, “It started out about 6 years ago with a federal law that changed the salary of professors in Germany.” The law cut a professor’s salary to 80% of its former amount, with the remaining 20% potentially to come as performance-related increments added to the basic salary.

The 16 states of Germany could award the performance-related increments as they saw fit, and they mostly interpreted this option as an opportunity to save money. Says Professor Heusch, “The end result of this is that a professor of cardiovascular medicine is often paid the same as a teacher. Now, this is not a good incentive for someone who will have to do many years of extensive training and research.” But even earlier in their careers, the would-be clinician–scientists might feel discouraged by pay disincentives. In the past, differences in pay for clinical work and for scientific research for young doctors in training did not exist, because in those days the doctors would move between both roles in the same institution. But now, punishing disincentives exist for those doctors who opt for careers in academic medicine.

Once, Germany represented a European stronghold for the development of talented clinician–scientists. Professor Heusch says, “It started out about 6 years ago with a federal law that changed the salary of professors in Germany.” The law cut a professor’s salary to 80% of its former amount, with the remaining 20% potentially to come as performance-related increments added to the basic salary.

The 16 states of Germany could award the performance-related increments as they saw fit, and they mostly interpreted this option as an opportunity to save money. Says Professor Heusch, “The end result of this is that a professor of cardiovascular medicine is often paid the same as a teacher. Now, this is not a good incentive for someone who will have to do many years of extensive training and research.” But even earlier in their careers, the would-be clinician–scientists might feel discouraged by pay disincentives. In the past, differences in pay for clinical work and for scientific research for young doctors in training did not exist, because in those days the doctors would move between both roles in the same institution. But now, punishing disincentives exist for those doctors who opt for careers in academic medicine.

On top of the financial disincentive comes the precariousness of the career path—which obliges the young clinician–scientist to gain tenure within a legally stipulated time. Professor Heusch says, “So, if you do not make it in a set period as a clinician–scientist, you have to move out of that career—’up or out.’ This is, again, a disincentive to start a career in academic medicine.”

Summarising the consequences of these disincentives, Professor Heusch says, “It is almost as if the entire system were designed now to destroy the enthusiasm of someone considering entering a scientific career in cardiology as opposed to a purely clinical one. The raw talent is there in our young doctors, but the obstacles are such that even I, as president of the German Cardiac Society, cannot blame a young doctor for not becoming a clinician–scientist. This is an immense tragedy for our nation and, ultimately, for our people and for European research.”

THE GERMAN CARDIAC SOCIETY PLACED AN ADVERTISEMENT IN A MAJOR NATIONAL NEWSPAPER TO HIGHLIGHT THE CRISIS

Professor Heusch admits that neither the German Cardiac Society nor the German Heart Foundation has the sort of financial influence of the British Heart Foundation, which supports 55% of cardiovascular research in the United Kingdom and which has purposely implemented a strategy to help reverse the decline in academic medicine there. He says, “We simply do not have the financial muscle to create change in that way. We have to use other strategies.”

For the first stage in his strategy to reverse the decline of academic medicine in Germany, Professor Heusch intends to make the nation and media aware of the crisis, its causes, and its eventual effects on the public. This awareness immediately puts pressure on the country’s politicians to address the problem quickly. Says Professor Heusch, “We have started this off by putting an advertisement into a major national newspaper (Figure 2).” In this, we detail our concerns. We say that, while in the short-term the only

Figure 2. The advertisement in a major national newspaper to highlight the crisis in academic medicine in Germany. The English translation is “Save heart research. Germany’s science is in danger!”

Deutsche Gesellschaft für Kardiologie

Rettet die Herzforschung
Der Wissenschaftsstandort Deutschland
ist in Gefahr!

Circulation European Perspectives
noticeable effect will be on academic medicine, in the medium-term there will be damage to progress on the treatment and prevention of the number-one killer disease in Germany. That is because we cannot encourage the best of our young talent to go into research.”

“Politicians and Regulators Are Now Talking to Us”

The advertisement strategy has proved immediately successful in that politicians have engaged with Professor Heusch and the society to discuss the crisis and its solutions. Professor Heusch says, “We went public with that advertisement only a few months ago, and both politicians and regulators are now talking to us about it, including those with the power to bring about change. I am also having a series of conversations now with trade unions in an effort to change the pay structure for young doctors. I am trying to convince the authorities to restore the old system or modify it to remove disincentives to clinician–scientists.”

The German Cardiac Society also strives to participate on the review boards that decide how the German Research Foundation and other foundations spend money. Professor Heusch cites a recent success: “The results of the elections to the review board of the German Research Foundation were announced in January 2008. Eight prominent members of the German Cardiac Society have been selected to sit on the 100-member medical review board of the foundation. Eight out of 100 is not such a bad proportion of representation for cardiovascular medicine.”

References

Robert Short is a medical journalist.

Pioneers in Cardiology: Gustav Born, FRCP, FRS

Gustav Born, emeritus professor of pharmacology at King’s College, London, United Kingdom, and research professor at the William Harvey Research Institute, St Bartholomew’s Hospital Medical College, London, talks to Jennifer Taylor, BSc, about his life and his pioneering work on platelets.

Gustav Born, FRCP, FRS, has a love of science that best manifests itself when he works with the right people, including coworkers and research students. Prominent scientists have had a great influence on his life, which began on July 29, 1921, in Göttingen, Germany. World events, too, have played their part.

Professor Born has an impressive scientific lineage. His father, Max Born, a physicist and one of the founders of quantum mechanics, won a Nobel prize in 1954. Professor Born was named after his grandfather, Gustav, a professor of anatomy and embryology at the University of Breslau (now Wrocław), Wrocław, Poland, whose most important discovery led to the development of the oral contraceptive pill. His grandfather’s father, Marcus Born, also had practised as an innovative medical man. This background had a palpable effect. “As soon as I became conscious of what one might do in life, I, too, wanted to do scientific research,” says Professor Born. He doesn’t feel as if his family pushed him into it—he describes his father as “a very reticent man”—instead, he recalls a more subtle influence. He says, “As a child and then as a teenager, all the great men of theoretical physics walked in and out of our house.”

Professor Born’s racial background provided another major influence. His father’s side considered themselves Jewish by race, not religion, and his mother was half Jewish. “On the non-Jewish side, I am a direct descendant of Martin Luther; so, sufficiently enough, I was brought up a Lutheran, not Jewish.” Christian upbringing or not, in 1933, Hitler’s influence pushed his family out of Göttingen.

“My father, because by then he was so famous, got offers from all over the world. But fortunately he chose to go to Cambridge, England, where he had been a student.” Professor Born went to The Perse School, Cambridge, from 1933 to 1936, then to the Edinburgh Academy, Edinburgh, Scotland, between 1936 and 1938, after his father became Tait Professor of Natural Philosophy (which actually fell more under the discipline of theoretical physics), at the University of Edinburgh.

Medical school at the University of Edinburgh followed. He says, “My parents saw the war coming, and my father said to me something I’ve never forgotten: ‘Why don’t you do medicine like your grandfather? Then, you won’t have to kill people in the war, and you’re less likely to be killed yourself.’ Which I thought was very sensible.”

Professor Born’s Interest in Platelets Began in Hiroshima

Professor Born graduated in 1943, at the height of the war, and the Royal Army Medical Corps sent him to the Far East.
Professor Born’s interest in platelets began in Hiroshima. “I arrived there about 4 months after the atom bomb was dropped, as part of the British occupation. I saw hundreds of people dying from haemorrhages because the radiation was destroying their ability to produce platelets. That left an everlasting impression of the importance of these little cells.”

Professor Born came home in 1946 and left the service in 1947, but he did not yet consider himself fit for a research job. The government paid demobilised people to study, so he opted for a year learning biochemistry and experimental pathology at University College, London.

A rocky patch followed, during which he considered leaving science altogether. This came in 1948; he had gone to the Sir William Dunn School of Pathology at the University of Oxford, Oxford, England, to do a DPhil. “My supervisor was uninspiring. The project he gave me was very boring. I was an interested young man, in every kind of thing. I was particularly interested in immunology, and I had an idea for which people later got Nobel prizes: the idea of autoimmune immunity. I thought, might it not be possible that some diseases would alter your body’s own proteins in ways that your immune system would recognise as foreign and, so, produce antibodies against them?” Professor Born’s supervisor discouraged him from pursuing this. “He said, ‘That’s rubbish; don’t think of way-out things like that—stick to growing your moulds.’ So, I was put off.”

But Sir Howard Florey, FRS, later Lord Florey and president of the Royal Society, and then head of the Dunn School, had observed the goings on. He urged the young Professor Born not to feel discouraged and sent him to the Medical Research Council’s Toxicology Unit in Carshalton, outside London, in 1951, where Professor Born spent 2 happy years working on his own ideas. He says, “Florey is one of my heroes—the world has him to thank for penicillin, and I have to thank him for my research career.”

In 1953, Professor Born accepted an offer from a friend, Geoffrey Dawes, FRS, CBE, to become university research officer at the Nuffield Institute for Medical Research in Oxford where Professor Dawes served as director. “It was the best thing I could have done,” he says. “Geoffrey Dawes was a wonderful man, and I contributed to his research on the physiological changes in the newborn.”

At the same time, Professor Born became a departmental demonstrator in pharmacology in the Department of Pharmacology of the University of Oxford, where he worked with 2 distinguished refugees: Hugh Blaschko, FRS, the son of his parents’ doctor in Berlin, Germany; and Edith Bülbring, MD, FRS. “With both of them, I worked on important projects, and valuable publications resulted,” he says. Professor Blaschko was working on how cells store adrenaline, and Professor Born joined him, a move that led in time to his research on platelets.

**Figure 1.** For 20 years, Professor Born worked on platelets and the mechanism by which they aggregate physiologically to stop bleeding and pathologically as thrombi causing heart attacks and strokes. Top, Platelet thrombus in a small vein. Bottom, Coronary lipid plaque with fissure and platelet thrombus.

Professor Born Established How Platelets Aggregate and That He Could Inhibit Platelet Aggregation

Professor Born explains: “Blaschko and I provided evidence that adrenaline is held intracellularly in ionic association with adenosine triphosphate. One day in the bath, on the bike, or maybe in the lab, I wondered where else in the body do I know of a highly active amine, like adrenaline, that’s stored in high concentrations.” He had heard or read that platelets stored 5-hydroxytryptamine, or serotonin, and he “went to find out how one obtains platelets.”

Professor Born isolated platelets and found a lot of serotonin, and then he looked for adenosine triphosphate. “I’ll never forget the day when I measured the adenosine triphosphate with the then-new firefly method,” he says. The galvanometer needle “flew off the scale,” proving that platelets contained a high amount of adenosine triphosphate.

“For 20 years, I worked on platelets and on the mechanism by which they aggregate physiologically to stop bleeding and pathologically as thrombi causing heart attacks and strokes,” Professor Born says (Figure 1). For these investigations, he invented the method of optical aggregometry (Figure 2), which has since received
worldwide use in fundamental and clinical investigations. “I am told,” he says, “that the original Nature paper has been cited more than 4000 times” (Figure 3).

Next came a “golden period” of 12 years as Vandervell Professor of Pharmacology at the Royal College of Surgeons in London, beginning in 1960. “The beauty of that job was it was almost entirely research,” he says. Professor Born continued to study the pathophysiology of platelets, of other blood cells, and of vascular endothelium.

By a “wonderful, happy coincidence,” Professor Born formed a lifelong friendship and “wonderful working relationship” with his lecturer, John Vane, FRS, later Professor Sir John Vane and Nobel Prize winner for discoveries in the field of prostaglandins, including the mode of action of aspirin. “The atmosphere was singularly innovative and productive, so that we published an extraordinary amount of valuable research, which has stood the test of time. I certainly was happiest during that time.”

“It Did Not Occur to Me, Nor to Most Members of the Medical Research Community, To Patent Inventions or Discoveries”

Professor Born’s response when asked whether he holds a patent for the Born aggregometer is: “I have been told that there are thousands of optical aggregometers around the world, and [I have been] asked why I did not patent the device. The reason is that before the Thatcherite degradation of everything in life to money, it did not occur to me, nor to most members of the medical research community, to patent inventions or discoveries; indeed, my Oxford professor, Howard Florey, was against patenting anything of potential medical value. So, the idea just never came up.”

Figure 2. Professor Born’s diagram showing the principle of his optical aggregometer. PRP indicates platelet-rich plasma.

Figure 3. Top, First aggregometer record. Note the slight upward anomaly on the lower tracings, caused by the release of aggregating agents from the platelets themselves and abolished by aspirin. Reprinted from Born with permission from the publisher. Copyright © 1962, the Nature Publishing Group. Middle, Title page of the platelet aggregation paper in Nature in 1962. Reprinted from Born with permission from the publisher. Copyright © 1962, the Nature Publishing Group. Bottom, The first demonstration of platelet aggregation inhibition by a drug (adenosine). Reprinted from Born and Cross with permission from the publisher. Copyright © 1962, Blackwell Publishing.

Professor Born established how platelets aggregate and, most important, that he could inhibit platelet aggregation. The latter discovery initiated the era of antiplatelet drugs for the prevention of heart attacks and strokes.
“Gus, as a Refugee Boy, One Does Not Turn Down Chairs at Oxford or Cambridge”

In 1973, Professor Vane accepted the research directorship of the Wellcome Foundation. “I didn’t want to stay on without him, really,” says Professor Born, who then received the offer of chair of pharmacology in Cambridge. “Professor Wilhelm Feldberg, a famous refugee pharmacologist, took my wife and I to dinner at the Swiss Centre in Leicester Square, and he said, ‘Gus, as a refugee boy, one does not turn down chairs at Oxford or Cambridge.’ So, I accepted the chair and a professorial fellowship at Gonville and Caius College.” But Professor Born did not find his 5 Cambridge years happy. He had to split his time between Cambridge and London, where his wife and children lived. In the department, no one had any interest in his line of work, and much of his time went into administration and teaching. During this time, Professor Born was approached about a Mastership at another college, but he declined. “I didn’t want to do that, because I’m a researcher, not an administrator.”

Professor Born Advises Young Scientists to be “Extremely Choosy” About Whom They Work With

Professor Born found his last academic chair, from 1978 to 1986, much more enjoyable. He fondly recalls being interviewed by Sir Richard Way, principal of King’s College, London, for the professorship of pharmacology. “I was invited to his room and we sat down, and he put some sherry or Scotch or something in front of me. For an hour and half, we laughed solidly, and I said, ‘This is the place for me.’” Professor Born made discoveries on atherosclerosis, his new concern, as other researchers were tackling platelets with the methods of molecular biology, with which he had little familiarity.

Research did not end with retirement, thanks to Sir John Vane, who had founded the William Harvey Research Institute at St Bartholomew’s Hospital in London. “John rang me up and said, ‘Gus, why don’t you come and join me, and we’ll continue to have fun together?’ I said, ‘Of course.’ I joined him in 1988, and I’ve worked there ever since.” “I still have ideas,” he says—for instance, why muscles hardly ever have tumour metastases, despite comprising about 40% of body mass. So, for the first time, he is conducting research on cancer. His other line of work aims to explain why heart attacks tend to occur earlier in diabetics.

Professor Born advises young scientists to be “extremely choosy” about whom they work with. “The subject matter is less important than the person you work with, because if you are with an inspiring person, that can set you up for life. That applies to supervisors, but also to colleagues like John Vane and, of course, to coworkers.” But should one accept a prestigious position in Cambridge or Oxford at all costs? “I think it depends entirely on individual circumstances. If you are happy elsewhere, I don’t think that necessarily applies. Feldberg was probably quite right in general anyway.”

References

Jennifer Taylor is a freelance medical journalist.

Chat Corner

The American Heart Association Is to Launch Its First New Journals in Nearly 3 Decades

As extensions of Circulation, the new Circulation portfolio of journals will deliver tightly focused information on areas at the cutting edge of cardiology, as well as clinical information designed to help practitioners in their daily practice. For information about the journals, please go to http://www.ahajournals.org/misc/circ_subspecialty_journals.dtl.

Correspondents for Chat Corner

For a regular new Chat Corner feature, we’re looking for correspondents from every European country to let us know about what’s going on in cardiology in their country, such as any new
• appointments,
• healthcare policies,
• initiatives,
• special prizes and awards.

If you are interested, please e-mail Lindy van den Bergh, at lindy@FLMC.co.uk.

The opinions expressed in Circulation: European Perspectives in Cardiology are not necessarily those of the editors or of the American Heart Association.