

# Are We Ready to Dare **More Harnack?**

Adolf von Harnack, the founding father of the Kaiser Wilhelm Society, was a courageous pioneer of new and future-oriented structures in science. Interestingly, his concepts have lost little or none of their topicality. Even today, the words he put down on paper must give us food for thought.

TEXT **MARTIN STRATMANN**

**D**oes Germany need the Max Planck Society? Would the country be missing something if there were no Max Planck institutes? These are questions that absorbed my attention before taking office, and caused me once again to revisit the origins of the Max Planck Society. Where better to begin than with Adolf von Harnack, a theologian and member of the Prussian Academy of Sciences. After all, it was his

anything that might have been imagined in Humboldt's day. "There are entire disciplines that no longer fit within the framework of the university, partly because they demand such extensive equipment and instrumentation that no university institute can afford them, but partly also because they address problems that are beyond the grasp of students."

Examples at that time included nuclear physics, organic chemistry and breakthroughs in biology, particularly infection biology. Harnack concluded – long before the age of mass-market universities – that "the laboratories and capabilities of the universities are proving less and less adequate, as ever greater requirements are rightly imposed on them to allow students to engage in the practical work that should become the focal point of their education, to the point where these needs threaten to monopolize all resources." His proposal to the then Kaiser foresaw the creation of professional non-university research institutes in the most modern fields of science of the time: institutes that Harnack wished to amalgamate within a uniform organization. He concluded "that in the organization of these research institutions, it is most important not to define their objectives in advance, but to allow them every freedom for future development. The direction of research should be a product of the personalities of the academics that lead them,

Still relevant in the present day: Adolf von Harnack, shown in a new light in the permanent exhibition at the Harnack House in Berlin. Starting in September 2014, a series of installations will document the history of the conference venue founded in 1929.

## No new alternative university model

memorandum penned in 1910 on the "*Necessity for a new organization to promote the sciences in Germany*" that ultimately led to the foundation of our predecessor organization, the Kaiser Wilhelm Society.

In his considerations, Harnack initially harks back to the ideal, developed a hundred years earlier by Humboldt, of the university as an institution that combines research and teaching as one inseparable unit, and that to this day constitutes the basic formula for most universities. Based on this successful underlying university structure, he analyzed the development in research up to the early 20th century and came to the conclusion that scientific research had developed an incredible dynamic that far exceeded







and of the development in science itself. Were the institutes to be dedicated, from the beginning, to specific purposes, it would be all too easy to be led down blind alleys, for science often exhausts itself with surprising speed.”

Harnack didn’t intend his proposal to lead to the complete separation of research and education. On the contrary, he wanted to make a distinction between a university, whose primary task in Humboldt’s sense is to provide a close combination of research and teaching, and a research organization that is dedicated first and foremost to research, but that characteristically also encompasses elements of education,

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## The education market has become more global

albeit highly specialized and tailored directly to the needs of research. His memorandum was thus not a draft for a new alternative university model – quite the contrary: it foresaw the continuous fruitful exchange of scientists.

There are two aspects of Harnack’s comments that are particularly striking: he makes no mention of any division between basic and applied research. His words are at all times colored by the understanding that the findings of basic research have a direct consequence for applications, and thus also for the welfare of society. Nor does Harnack ever speak of excellence. Universities and the new non-university institutes may differ in terms of a division of labor based on partnership, but not in terms of their quality. To think otherwise would have been inappropriate, for at the start of the 20th century, German universities were setting international standards, and with just about 55,000 students, they were outstanding institutions.

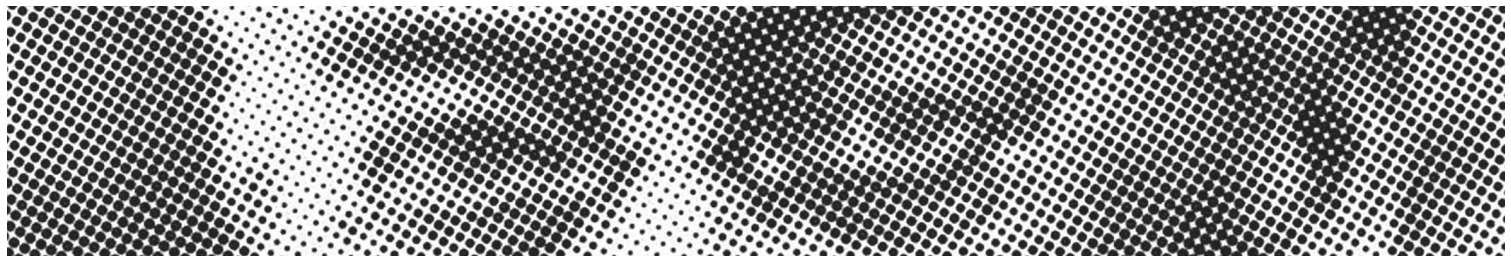
And today? If anything has changed, it is that the number of students in Germany now stands at over 2.5 million! Over half of each annual cohort now goes on to study at a university, and rightly and primarily desires a good academic education as a means of successfully embarking on a career. Only very few

of them are genuinely interested in the advancement of science. German universities are thus forced to perform a balancing act. They must guarantee that half of each cohort receives an outstanding education, and at the same time, they must provide a high quality research infrastructure for what is likely to be a very small proportion of their students. A research infrastructure that is becoming steadily more complex and expensive!

If one compares Harnack’s comments with the present day, one is bound to agree that his analysis is more relevant than it ever was, with universities that are almost at the point of collapse under their educational burden, the exploding costs of infrastructures that can be operated only by skilled professionals, and international competitiveness that must be safeguarded also in economic terms. And in the midst of all this are highly motivated and capable scientists, the best of which are coveted internationally, who must be courted and who are quickly lost if the general conditions aren’t right.

Moreover, the education market has become more global, and students more mobile. Many of them are guided primarily by the reputations of universities or research institutions. Reputations are a credible indicator of outstanding performance in research and teaching – and thus a promise of an optimum education and an ideal start to a career. A glance at the Shanghai ranking shows that the US research university model is particularly successful, with just three non-US universities among the top twenty in the current ranking: Cambridge, Oxford and the ETH – none of which are in Germany.

Harvard, Stanford, Yale – these are the highly successful scientific international gold standard. With a generous budget (Harvard has over three billion euros per year at its disposal), they attract the world’s best professors, they have developed professional management structures, and they provide a small number of students with a hands-on scientific education. Josef Joffe, editor of the German weekly *DIE ZEIT*, recently published a commentary entitled “*Der Olymp macht zu*” (Mount Olympus slams the door) in which he remarked on current figures indicating that Stanford University will accept only 2,100 applicants this year, out of a total of 42,000. That’s a mere 5 percent, compared with 20 percent 30 years ago!



The Anglo-American system is optimizing itself at the cutting edge: universities are becoming a primary filter in the selection of a social elite that more or less inevitably will go on to occupy leading positions in politics, industry and science. This is the only way to justify the enormous tuition fees, and the only explanation for the huge endowments. In 2012/2013, Stanford University alone pocketed over 900 million dollars in donations, or four times the budget of the University of Heidelberg.

In Germany, unlike the US or England, there are no marked differences in quality between the universities – despite the Excellence Initiative. Our universities are funded almost entirely out of the public purse – funds that must be democratically justified – and open to all those with the relevant abilities. Germany puts its faith in very high quality, and in internationally recognized, broadly available education, and takes a skeptical view of the formation of social elites at isolated educational institutions.

Nevertheless, Germany has succeeded in creating a climate for research at the very highest level; a climate that is attractive to the leading international scientific elite and that bears comparison with the leading American universities. The Max Planck Society, in close cooperation with the broad-based universities, has an important role to play: the Society is a scientific beacon with the ability to fill young people with enthusiasm for research, to help prevent the best among them from migrating, but also to attract outstanding minds from abroad.

With our particular combination of breadth, depth and permeability, we in Germany can hold our own at the cutting edge – scientifically as well as economically, and with no little interdependence between the two! By contrast, many other countries have, in recent years, either entirely lost their former scientific prominence, or failed even to reach the front rank of research nations, with substantial consequences for their economic performance capabilities.

But is the status quo sufficient? Surely all of us who have visited Asia can see the competition we are facing from that region. Not just economic competition, but in research and education. Can we imagine what it will mean if, in the future, 40 per cent of students worldwide come from Asia? Won't our country then, more than ever, be in need of

young, creative people from across the world – young people who we can encourage, after studying for a while in Germany, either to remain here or to return home as future ambassadors for Germany? Are our educational institutions truly visible and at-

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## We need European career structures

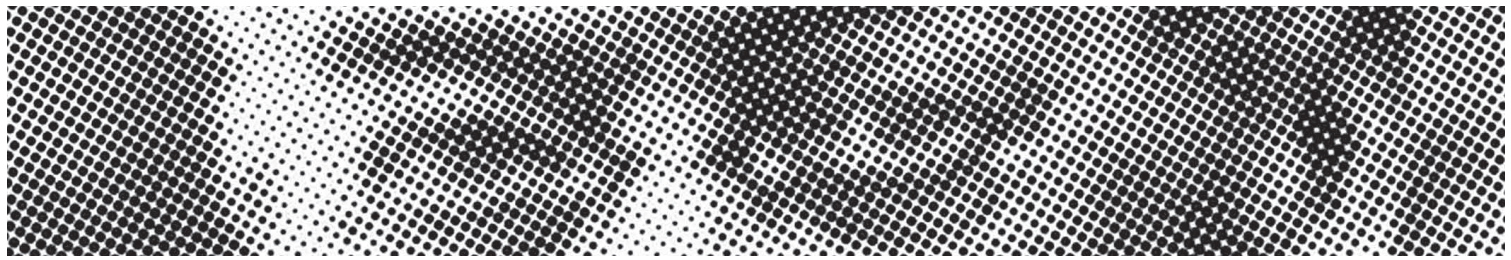
tractive, and do they offer potential students from across the world the prospect of a reputation that counts for something in their homeland? Don't we need to be particularly attractive if we are to offer young scientists the incentive to overcome the language barriers? Despite the enormous tuition fees, the US currently attracts almost ten times more Chinese students studying abroad than Germany does. Why? Do we have the courage to adapt our structures to the new conditions prevailing in the global education market? Are we willing to revise our ways of thinking in order to make the best of the resources and structures available to us? Or to put it briefly: Are we ready to dare more Harnack?

As in Harnack's day, we find ourselves in a period of tremendous scientific and social change that is defined by the competition between the wider regions of Asia, America and Europe. Now, as then, economic and scientific aspects are tightly interwoven. How will Europe – how will Germany – position itself in the course of this (not only) scientific contest? What goals must we achieve to ensure that the continent we all value so highly performs well?

Let me summarize goals and means in four propositions:

### 1. Development in the European Research Area must serve our overall interests.

If we consider the total numbers of Nobel Prizes for science that have gone to Europe and the US, the figures aren't very far apart. However, if we look exclusively at the trend since World War II, we must concede that the US is now much better off than Europe.



Of the ten institutions hosting the most Nobel laureates, only two are European: the University of Cambridge and the Max Planck Society. So there is much to do – and all the more so given the yawning gaps between research areas within Europe. It is simply

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## Our commitment in Eastern Europe is of particular interest

not acceptable in the long term that entire countries should have no chance in the contest for outstanding scientists. And if we are to offer good prospects for advancement for young scientists throughout Europe, we need European career structures similar to those in the US. After all, in Europe as a whole, there are 183 universities that feature among the top 500 in the Shanghai Ranking (by comparison, there are 149 in the US), albeit very few of them in Eastern Europe. The Max Planck Society already has institutes in three European countries (Italy, Luxembourg and the Netherlands). This European commitment could be expanded. And it is to the benefit of Germany that this should happen, given that we must necessarily have a major interest in the continuing economic and scientific development of Eastern Europe in particular. Europe must make itself more attractive to students of outstanding caliber, and alter the ratio of “brain drain” to “brain gain” in its favor, and do so with sustained effect. Universities and research organizations will be of fundamental importance in this process.

**2. Expenditures for education and research will increase. The scale of the necessary investment, however, will be determined by our competitors rather than by us.**

We can't rest on the laurels earned in past years. The lead the German economy holds will last, not for decades, but for just a few years, at best. And as the past has shown us, economic monocultures are in themselves a danger. We therefore need to see an ever-expanding diversification of our economic base,

founded on scientific innovations. Consequently, we must strengthen the universities, and we must do so through structural diversification and not by way of general, uniform budget increases. An increase in basic funding should be a matter of primary consideration, since universities, too, need both scientific and financial scope to define and determine the foci of their research for themselves. What sets the German university landscape apart on an international level is its high and homogeneous performance capacity and its availability to all – an advantage that must under no circumstances be forfeited. Therefore, we need educational opportunities for all, and we should attach no small value to the diversity and high quality of Germany's educational institutions, from technical colleges to internationally renowned universities!

**3. We must create genuine added value through cooperation, particularly with an eye to the formation of a scientific elite.**

Broad-based universities and highly specialized Max Planck institutes can form a sound foundation for science in Germany only if both sides cooperate with one another intelligently and efficiently. The key question is: How can one commit to networking without losing one's own specific identity? How can one create genuine added value through cooperation between organizations that are otherwise pitted against one another in competition for resources and personnel – cooperation that is sincerely desired, that is beneficial and that isn't imposed by compulsion? Local campus structures have a major role to play, as these structures – in addition to scientific training – can also cater to the social needs of individuals and families. I also see great opportunities in the development of supra-regional science-driven clusters in future-oriented scientific fields. In this context, we can concentrate on the most internationally visible areas of concentration, and in so doing, substantially strengthen the attraction of graduate training for students with an enthusiasm for science, and play a part in the development of internationally visible career paths. Our goal must always be to bring together intelligent minds with an interest in research.



**4. The Max Planck Society must not only focus more on young people and women, it must also be more courageous in the future orientation of its institutes.**

Albert Einstein was 36 years old when he first published his general theory of relativity in 1915. Two years had passed since Max Planck had brought him to Berlin, and at the age of 38 he became Director of the newly established Kaiser Wilhelm Institute for Physics. Einstein was certainly an exceptional talent, and yet experience shows that it is at this age that many scientists make their decisive breakthroughs –

## Science must become more attractive to women

which they should make with us! However, the Max Planck Society must not only focus more on young people, but also on women. Now that we have a large number of women among our doctoral students and post-docs, we must once and for all ensure that they are willing and able to carry on working in science. We find ourselves here in competition with numerous business undertakings, and it is a contest that we can win only by offering convincing alternatives.

Of course, science doesn't stand still; it goes merrily on its way, paying no heed to any increases that may or may not be granted to us: Entirely new branches of science are developing in the space between the natural sciences and the humanities, the field of computer sciences has staged an unprecedented triumphal progress, while the boundaries between chemistry and biology are disappearing and intelligent materials are revolutionizing the materials sciences. We shall address many of these topics – and in the future, we will probably find ourselves more than ever consistently questioning and, where necessary, readjusting the orientation of existing institutes. Only by so doing will the Max Planck Society remain in a position to dare to venture into new areas of research, thereby redefining the boundaries of knowledge. ◀

## THE AUTHOR



**Prof. Dr. Martin Stratmann**, born in 1954, studied chemistry at the Ruhr University Bochum and received his doctorate at the Max Planck Institute für Eisenforschung (iron research) in Düsseldorf. After spending two years as a post-doc at Case Western Reserve University in Cleveland, USA, he returned to the MPI für Eisenforschung as a staff member, and subsequently as Leader of the Corrosion Research Group. From 1994 to 1999, Prof. Stratmann worked at Friedrich Alexander University in Erlangen, where he held the Chair for Corrosion and Surface Technology. In 2000, the Max Planck Society appointed him a Director at the MPI für Eisenforschung. In June 2014, Martin Stratmann took up the post of President of the Max Planck Society.

This article is an abbreviated extract from the inaugural address delivered by Martin Stratmann at the Annual Meeting on June 5, 2014.