



Transformative Science? Transformative University?

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Reflection on science is now one formula richer: *transformative science*. Not long ago, the descriptions used here were “responsible science” and “citizen science”. As responsible science, as it is said, science meets the requirement to ensure the integrity of the research process as well as to follow society’s call to solve societal problems. As citizen science, as it is said, science compensates for the purported societal lack of participation in the research process. And now transformative science.

In fact, science, in a general sense, is always transformative, against itself – any scientific insight also alters scientific knowledge – and against society, if one thinks of the transformation of theoretical knowledge into practical, application-relevant knowledge. Where insights within science itself have evolved, they are referred to as scientific *progress*, in case of fundamental new insights as scientific *revolutions*,[1] where external effects of scientific insights are registered, they are referred to as *innovations*, i.e. technique-oriented applications of scientific knowledge with regard to societal aims. What, actually, is new when we today, mainly in connection with the call for *sustainability*, talk so strongly about transformative science? Is it a matter of substance, of the rediscovered nature of science, or is it a matter of rhetoric, i.e. science marketing? Science, so it seems, plays with its nature. A wakeup call.

Science connects *epistemic* structures, i.e. the way science understands the world, with (scientific) truth, and it connects *institutional* structures with (social) reality. Both structures form a complicated unity within science itself in which the distinction between internal and external elements, for example internal norms like logical consistency and external norms like applicability, threatens to become blurred. For science is both the particular form of knowledge formation as well as the institutional form of this knowledge formation itself, the university being the paradigm of such a connection. It is the institutional aspect which interests us here, namely the concept of a transformative science, by which science is determined by social and environmental objectives. For example, in a proposal for the Cancun conference on climate change in 2010, calling it the *Great Transformation*, the principle of sustainability, a concept nowadays used in an almost inflationary way, is declared to be a comprehensive programme, based on a new social contract which includes science and the university.[2]

Under the title ‘transformative university’ with the objective of a *sustainable society*, diverse forms of obligation of the university are discussed today. They range, mostly on a systems-theory background, from a recollection that universities serve not only (scientific) truth, i.e. autonomously determined knowledge formation, but also the objectives and aims of a society which recognizes in science an essential basis of its progress, to a direct commissioning of the university according to social objectives, in this case the realization of a sustainable society. The university, as we know it, not only since Wilhelm von Humboldt, is becoming a *sustainable university*. Its definition runs as follows: “The sustainable university is one that through its guiding ethos, outlook and aspirations, governance, research, curriculum, community links, campus management, monitoring and *modus operandi* seeks explicitly to explore, develop, contribute to, embody and manifest – critically and reflexively – the kinds of values, concepts and ideas, challenges and approaches that are emerging from the growing global sustainability discourse”.[3]

In this rather vague definition, the coordination of the system, university, which is part of the system of science among other systems like politics or economy, is succeeded by the subordination of the university to these systems. Reference is to a model, *Humboldt 2.0*, in which the search for (scientific) truth and knowledge no longer determines the pace of the university but rather service to society, here with respect to sustainable progress.[4] By the way, this task can also be found in concepts like a stakeholder university or an entrepreneurial university. Here, too, not scientific or academic interests guide the university, but rather social, particularly economic interests. Its self-conception in the old sense is then described in such a way that universities “provide research and teaching in return for public funding at a relatively high degree of institutional autonomy; under this contract, the universities, often supported through research-funding agencies, have been expected to generate fundamental knowledge for society, and to train the highly qualified manpower required by an advanced industrial society”.[5] But what is wrong with this description? Certainly not that the university fulfils its obligations towards research and teaching. That it sticks to the image of linear process leading from university research to applied research? Indeed, this image is questionable, but for other reasons than those

usually given. It is not the utilization of science and the university for a sustainable society, thus a social-theoretical argument, which speaks against a linear transfer model from basic research to applied research, but this distinction itself, thus a science-theoretical or epistemological argument.

As a matter of fact, basic research, applied research and development today form a *triangle of research*, often mutually supportive in concrete research programmes both in and outside the university. They interlock and intermingle when focusing on a problem. Pure basic research still exists only in very special research fields; application-oriented basic research is becoming more and more the norm. The archaic simplicity (sometimes simplemindedness) in research affairs has become a complex interlocking of interdependent research orientations. This means that the goals of science, in as much as these are expressed by such ideals as truth and knowledge, are more and more joined to the goals of a world that is less inclined to admire than to apply the results of science. Again, this is an inner-scientific, and also an inner-university development, nothing imposed by the society or by a paradigm shift turning the university into a transformative or sustainable university.

All the same, it is said that it is society which started a transformation of science. With the catchword *mode 2* a fundamental change in the relation between science and society has been described,[6] meaning a shift from 'reliable knowledge' to what is now called 'socially robust' knowledge:[7] "The latter characterization is intended to embrace the process of contextualization. For 'socially robust' knowledge has three aspects. First, it is valid not only inside but also outside the laboratory. Second, this validity is achieved through involving an extended group of experts, including lay 'experts'. And third, because 'society' has participated in its genesis, such knowledge is less likely to be contested than that which is merely 'reliable'".[8] At the same time it is claimed that socially robust knowledge is superior to reliable knowledge "because it has been subject to more intensive testing and retesting in many more contexts – which is why it is 'robust' – and also because of its malleability and connective capability".[9] With this, science and the university are committed to a societal programme; research becomes programme research and is socially determined. Such a turn ignores the fact that autonomy is not an external property of research, and that the scientific community does not represent itself as an individual entity which can be controlled from outside. But what might be even more serious: here, it is not only the *status* of science that is changing (or is meant to be changed), but also, in a highly problematical sense, the *concept* of science. The new concept, one could say, is the concept of science studies, which is a sociological concept, not the concept of philosophy of science and science itself.

As far as the university and its redefinition as transformative (or even more: as a sustainable university) is concerned, this definition, taken by itself, is rather strange. After all, it is not the transformativity and sustainability of the university that is at stake, but rather its autonomy in research and teaching as well as its responsibility in dealing with problems which the world offers and with the future of society. The transformativity and sustainability of the university – if one really wants to talk this way – is, ironically, endangered only if the university should become obliged to obtain the protection of transformativity and sustainability in the defined sense and, accordingly, if its autonomy were to be restricted.

In this situation, I plead for more modesty and a sense of proportion. The university does not solve the problems of the modern world, but it certainly can contribute to their solution. In the case of climate research, but also, for instance, in the case of energy and medical research, this is obvious. However, the best way for the university to serve society is to stick to its core missions – (basic) research and teaching that is close to it, care of fields and disciplines, training of young scientists – and thereby to develop a strong sense for the solution of practical problems as well. This is the (epistemological and, at the same time, moral) meaning of a *research imperative* or research commandment which can be formulated as follows: Let yourself be guided by the thirst for the new and the will to know what innermost holds the world together, but remember that it is no lesser goal to hold that world together with what you do in research and development.[10] Whoever follows this imperative, here in its meaning as a moral imperative, follows the right track anyway. He holds fast to the strengths of science and the university and does not deliberately put these strengths at risk in favour of a – always a bit trendy – transformativity and sustainability rhetoric. The strongest critic of science, also in these matters, is always science itself.

[1] See Th.S. Kuhn, *The Structure of Scientific Revolutions*, Chicago and London: University of Chicago Press 1962, 3rd edition 1996.

[2] WBGU (Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen) (ed.). *Welt im Wandel: Gesellschaftsvertrag für eine Große Transformation. Hauptgutachten*, Berlin: WBGU 2011.

[3] R.S. Sterling, "The sustainable university: challenge and response", in: R.S. Sterling *et al.* (Eds.), *The Sustainable University: Progress and prospects*, London and New York: Routledge 2013, p. 23. See also H. von Weenen, "Towards a vision of a sustainable university", *International Journal of Sustainability in Higher*

Education 1 (2000), pp. 20-34; D. Fisher *et al.*, "Getting an empirical hold of the *sustainable university*: a comparative analysis of evaluation frameworks across 12 contemporary sustainability assessment tools", *Assessment & Evaluation in Higher Education* 40 (2015), pp. 785-800.

[4] U. Schneidewind and M. Singer-Brodowski, *Transformative Wissenschaft: Klimawandel im deutschen Wissenschafts- und Hochschulsystem*, Marburg: Metropolis Verlag 2013, pp. 102-103.

[5] M. Gibbons, "Science's new social contract with society", *Nature* 402 (2 December 1999), C81.

[6] M. Gibbons *et al.*, *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies*, London etc.: Sage Publications 1994.

[7] H. Nowotny *et al.*, *Re-Thinking Science: Knowledge and the Public in an Age of Uncertainty*, Cambridge: Polity Press 2001.

[8] M. Gibbons, "Science's new social contract with society", C82.

[9] M. Gibbons, "Science's new social contract with society", C84.

[10] See J. Mittelstrass, *Schöne neue Leonardo-Welt: Philosophische Betrachtungen*, Berlin: Berlin University Press 2013, p. 170.