

CHAPTER 1

The Commodification of Academic Research

Hans Radder



SINCE THE 1980S, most universities in the Western world have experienced substantial changes as a consequence of an ongoing process of commodification. Commodification affects a variety of aspects of higher education, such as research, teaching, administration, and even such nonacademic activities as the intercollegiate sports programs of U.S. universities. This book focuses on one of these aspects, namely the commodification of academic research.¹

The aim of the book is to describe, analyze, and evaluate the various facets of commodified academic research from a philosophical perspective; in addition, where appropriate, alternatives to commodified research will be proposed and discussed. More specifically, we will approach the subject from the perspective of philosophy of science, social and political philosophy, and research ethics. A comprehensive discussion of the phenomenon of commodified science requires a view of the nature and justification of science as a whole, as well as an account of the nature and justification of specific research methods within particular sciences. Hence there is a central role for the philosophy of science. Simultaneously at issue is the question of the actual and desirable sociopolitical institutionalization and organization of science in modern societies. For this reason, the perspective of

social and political philosophy is needed. Finally, commodification engenders far-reaching moral issues concerning appropriate conduct in academic research, which is the domain of research ethics. Given the multifaceted nature of the problem of the commodification of academic research, bringing together these different disciplines and approaches is important, and even necessary, for developing in-depth analyses, assessments, and alternatives.

Some good work on the commodification of science has been published recently, primarily by concerned journalists and by natural and social scientists. Moreover, several funding agencies and science policy organizations have issued relevant studies and policy papers on the subject. The contributions to this book use this and related work for the purpose of obtaining relevant empirical knowledge, detailed philosophical analyses and pertinent normative assessments of the commodification of academic research, as well as formulating sensible and practicable alternatives to commodified science.

Thus far, philosophers have hardly begun to explore this subject. Yet sustained and in-depth philosophical study of the commodification of academic research is badly needed. Because of a strong naturalistic tendency in recent accounts of science (both in cognitive and in social studies of science), the normative question of what should count as “good science” has shifted to the background. However, if we want to come to grips with the issue of the commodification of academic inquiry, this question should be center stage. By publishing this book we hope to provide the necessary stimulus for further philosophical research in this area.

The book aims to advance the subject by providing substantial research contributions. The chapters focus on various basic questions regarding the commodification of academic research. The contributions to the book are not, or not primarily, of a “case study” type; instead, they aim (more directly) to present and examine theoretical and philosophical analyses, discuss sociopolitical and moral assessments, and provide viable alternatives. Of course, such approaches need to be informed by the existing literature on the practices of commodified academic science. In addition, several of the chapters, including this one, show that the insiders’ experiences of their authors as employees of academic institutions also inform their analyses and assessments in important ways.

This opening chapter introduces the subject of the commodification of academic research. It has two objectives. The first is to provide a conceptual map of the area. For this purpose, it presents and explains the pertinent concepts, cites the relevant empirical literature, discusses the major epistemic, ethical, and social problems, and reviews several proposed solutions. The second objective of this chapter is to place the other chapters of this volume on this map of the area. To this end, the approach taken in these chapters and their contribution to the re-

search arena is sketched. This should not be taken to imply, however, that all contributors will endorse every single claim made in this chapter.

The guiding framework for this chapter is provided by seven *central research questions*. These questions constitute a comprehensive directory to the issue of the commodification of academic research.

1. *What, exactly, do we understand by “commodification of academic research”?* Answering this question includes addressing several more specific issues, such as: What are the historical roots of the notion of commodification? Is commodification limited to pecuniary matters? How does it differ from applying science? Is a private but nonprofit university an academic institution?

2. *Which forms of commodification of research can be distinguished?* Key notions in discussing this question include: commercialization, contract research, privatization, patenting, scientific productivity, publish-or-perish culture, marginalization of noncommodified research, and the demise of public interest science.

3. *How widespread and novel is the phenomenon of academic commodification?* Here, it is important to differentiate between present and past academic science, between different disciplines in present and past academic institutions, and between different national research systems.

4. *How should we assess the commodification of academic research?* From a theoretical perspective, the underlying question is what are, or should be, the basic ideas guiding the desirable behavior of academic researchers and the preferred institutionalization and organization of academic research? In particular, this question includes the meta-issue of the legitimacy of philosophical critique and normativity, and the nature (for instance, epistemological, political, or moral) of its assessment criteria.

5. *How to assess the actual practices of commodified research?* What are the pros and cons of the practices employed by this research? Addressing this question includes an analysis and evaluation of the impact of commodification on methodological procedures, epistemic appraisals, and public trust in scientific inquiry.

6. *Can the drawbacks of commodification be countered by regulation?* Here one should distinguish between external regulation by governmental agencies and self-regulation through ethical codes. A major issue is whether regulation can be effective in the case of structural patterns (rather than incidental instances) of commodification.

7. *What are the alternatives to commodified science?* Theoretically, we may distinguish between three ideal-typical models: commodified science and the alternatives of autonomous and public interest science. Do these models fully exclude one another? Are they compatible? Or can they even be combined in some way? And if alternatives to commodified science (for instance, autonomous or

public interest science) are seen to be preferable, how can they be practically institutionalized?

The subsequent sections briefly discuss several aspects of these central research questions.² Thus, these sections provide a conceptual map of the area of commodified academic research. Furthermore, they introduce the subsequent chapters by situating their basic approaches and main claims on this map. These chapters make a substantial contribution to the study of the central research questions, although it will be clear that they do not pretend to provide full and final answers to all aspects of these wide-ranging and difficult questions.

I. The Commodification of Academic Research

The commodification of academic research is a complex phenomenon that can be described in different ways. In a narrow sense commodification is identified with commercialization, that is, the pursuit of profit by academic institutions through selling the expertise of their researchers and the results of their inquiries. This definition evidently covers an important aspect of commodification, but it also overemphasizes the role of the academic institutions themselves. From a broader perspective, academic commodification is part of a comprehensive and long-term social development. This development is often described as the economization, or economic instrumentalization, of human activities and institutions, or even entire social subsystems. In this wider and more appropriate sense, academic commodification means that all kinds of scientific activities and their results are predominantly interpreted and assessed on the basis of economic criteria. Since real-world patterns are never a matter of all or nothing, it is important to keep in mind that commodification implies the dominance of economic criteria, and not their absolute prevalence.

To illustrate the claim that commodification is broader than straightforward commercialization, consider the following real-life story. In the course of 2007, the top administrators of my university, VU University Amsterdam, decided that its research should be clustered in a limited number (say fifteen) of big research institutes. Key characteristics of these institutes should be a clear focus on a specific theme, a substantial mass of senior researchers (one hundred or more), and a sizable participation from different disciplines. The faculty board of the Faculty of Philosophy complied with this plan and started a process of incorporating all philosophical research into two big interfaculty institutes. A letter detailing eight different arguments why this reorganization could not be expected to lead to an

increase in the quality of the philosophical research—based on an analysis of what constitutes high-level, international research in philosophy—was completely overruled, or rather ignored, by the university board in favor of the claim that the proposed reorganization was the only way to acquire more external research funding. Although this claim is arguably questionable in the case of philosophy, the story perfectly illustrates the appropriateness and significance of the broad notion of commodified science introduced above. Major decisions that affect the organization and nature of university research are taken primarily on the basis of economic criteria, at the expense of more substantive arguments (such as those deriving from the nature of philosophical inquiry). Thus an important advantage of the broad construal of the notion of commodification is that it also covers those cases of commodification where there is no direct external funding by commercial firms, as is often the case in the social science and humanities disciplines.

What this definition of commodification also shows is that commodified research does not coincide with so-called applied science. If we take this term (for the sake of argument) to mean science used for purposes other than the development of science itself, then as yet nothing is implied about the nature of these purposes. Although it is true that, in our present-day “knowledge economy,” the implicit or explicit identification of these purposes with economic purposes is pervasive, there is no necessity to do so. Science can be used, and still is being used, in the more general interests of the public.³ Hence, fundamental philosophical thinking needs to avoid conflating applied and commodified science (as, for instance, Wise [2006, 1262–66] does). Put differently, commodification as economic instrumentalization needs to be distinguished from other forms of instrumentalization, in particular from technological instrumentalization.

The term “academic” also requires some explanation. A minimal construal of this term is to have it refer to those universities that are wholly or largely funded by public tax money. This minimal construal, however, is too narrow for the purpose of a comprehensive examination of the issues at hand. We should, at least, add basic research and scholarship in independent, publicly funded institutions, such as the Royal Netherlands Academy of Arts and Sciences or the Netherlands Environmental Assessment Agency, and their counterparts in other countries. In some countries, however, there are private, yet nonprofit universities. Hence one could argue that the relevant distinction for an academic institution is not being publicly or privately funded, but being a nonprofit or a for-profit institution. On this basis, Harvard University—which is a private, nonprofit research university—also counts as an academic institution, which certainly fits our common-sense understanding of academic institutions.

Several chapters of the book offer detailed analyses of the complex historical development and the conceptual intricacies of the notion of commodification. Through focusing on the idea of an academic culture, Daniel Kleinman unambiguously advocates a broad approach. From this perspective, he documents the profound transformation of this culture and the concomitant rise of an entrepreneurial ethos. Mark Brown similarly endorses a broad account of commodification. Drawing on a variety of studies in social and political philosophy, he emphasizes an often mentioned aspect of economic instrumentalization: commodification implies the expropriation of goods from the particular communities that produced them by reducing the intrinsic, community value of these goods to their pecuniary exchange value on an independent market. Further sociopolitical analyses of commodification, in particular the commodification of knowledge, are provided by Steve Fuller. He distinguishes, in chronological order, four levels of commodification: ideal-market, industrial, semiotic, and epistemic commodification. The last level pertains to the present and implies that present-day knowledge is not merely a means to commodification at the other three levels, but is itself the subject of pervasive processes of (epistemic) commodification. Another telling aspect of academic commodification is the large change in meaning of the related concept of intellectual property. As Henk van den Belt describes in detail, the present meaning of intellectual property as a kind of commercial monopoly strongly contrasts with its original sense as a form of immaterial recognition for outstanding scientific achievements.

In the discussion above I distinguish between commodified and applied, and between academic and nonacademic research. This does not imply, however, that the study of the commodification of academic research cannot benefit from analyses of industrial science or from investigations of knowledge in applied contexts. Thus Martin Carrier observes that recent academic and industrial research have converged in methodologically and epistemologically significant respects. Hence analyzing high-tech industrial science, he claims, may teach us important things about the future of academic inquiry. Harry Kunneman also points to the epistemological and methodological continuity between basic and applied science, but then goes on to argue for a noncommodified practice of applied research.

2. Analyzing Forms of Commodification

From the broad definition, different forms of commodification may be distinguished. Consider the following current practices. Frequently practiced these days

is research contracted by an external, commercial firm. This research may be small-scale, for instance in the case of funding one doctoral dissertation project concerning a limited topic of direct interest to a particular firm. Or it may be large-scale, as in the case of so-called strategic alliances, in which a research group or entire department agrees on a five-year, or even ten-year, contract with a big corporation. In the case of such strategic alliances, the agreement involves that the corporation will provide extensive research funding on the condition that it will have the exclusive right to commercially exploit the research results. External funding may also come from noncommercial organizations. Quite a few academic research projects or programs are financed, partly or wholly, by specific governmental agencies or by other social organizations. If financial goals and interests acquire a predominant position in such projects or programs, they become commodified as well. Another frequent practice is the establishment at an academic institution of all kinds of special professorships or ordinary chairs paid for in part, or even wholly, by external companies. It will be clear that such practices may easily lead to commodification (even if it is not logically necessary). Finally, it is well known that the impact of scientometric indicators on the direction and content of academic research has increased dramatically. However, the fact that the major scientometric databases are compiled and exploited by private firms is either less well known or taken for granted. Hence, a comprehensive analysis of the commodification of academic research should include a detailed scrutiny of the possible influence of the commercial interests and policies of scientometric companies on the construction and uses of such databases. An intriguing question, for instance, concerns the impact of the procedure for the inclusion of journals in Thomson Reuters's influential citation indices, which is, in part, a "company secret" (Leydesdorff 2008, 282).

Thus far, it might seem that commodification is, as it were, externally imposed on the university. This is only one side of the coin, however. In fact, the universities themselves are also actively engaged in profit-seeking activities. The ever decreasing funding by public governmental agencies is often cited as the main reason for this type of commodification. One important form this phenomenon has taken is the acquisition and exploitation of patents on the results of scientific research. For example, the patenting of (parts of) organisms, such as genes, appears to be an accepted practice in academic departments in the biomedical sciences. More generally, it is not unusual anymore that acquired patents are acknowledged as legitimate academic achievements, and seen to be as valuable as journal articles.

It would be a mistake, however, to limit our analyses to exchanges of money. Economic instrumentalization of academic research also takes place through a

variety of formal and informal personal ties. Increasingly, researchers who are employed by an academic institution are simultaneously running their own businesses. This is of course of particular significance if their research and their business are in the same area. Also, in the case of externally sponsored professorships and chairs, the significance of personal relationships may outweigh the import of the actual sums of money involved. Furthermore, as we have seen in the previous section, commodification is also realized through an increased corporate structure in university administrations. One way in which this is expressed is through a prevalence of economic vocabularies and metaphors. Thus, the University of Twente promotes itself as an “entrepreneurial” research university (although the original Dutch term—*ondernemende universiteit*—could just as well be translated as “enterprising” university!).

All of the subsequent chapters address one or more of these forms of commodification, but some of them examine particular forms in more detail. Thus, the chapters by James Brown and by Albert Musschenga, Wim van der Steen, and Vincent Ho analyze the issue of commercial funding of pharmaceutical research, with a special emphasis on randomized clinical trials in medical science. David Resnik’s contribution discusses the impact of external financial interests in general, whether commercial or noncommercial. Sabina Leonelli provides an in-depth investigation of a more specific aspect of commodification, namely its impact on the nature of data exchange in contemporary biology and medicine. Harry Kunneman points to the state-controlled economic instrumentalization of science, in particular in modern China. The issue of academic patenting and licensing is examined in detail by Sigrid Sterckx, while it is used in my own later chapter as the main illustration of a proposed account of Mertonian values and scientific norms. Finally, the chapters by Daniel Kleinman and Mark Brown include explicit discussions of the commodification of university administration and the rise of entrepreneurial vocabularies and corporate metaphors.

3. How Widespread and Novel Is Academic Commodification?

Further study of these different forms of commodification should answer two important empirical questions: how widespread is academic commodification, and how novel is it? During the past five to ten years, several studies addressing these questions have become available.⁴ As a matter of course, the chapters of this book both build upon this work and add to it. Although further empirical studies are very welcome, we may already conclude that, in recent times, the commodification

of academic research is a substantial and significant phenomenon. The Dutch Advisory Council for Science and Technology Policy (Adviesraad voor het Wetenschaps- en Technologiebeleid) has provided some quantitative data. For instance, in 2001, 42 percent of all scientific research in the Netherlands took place in academic institutions, while 58 percent took place in companies. In countries like Finland, Japan, and the United States, the former figure is substantially lower and hence the latter substantially higher (AWT 2005, 55–56). Furthermore, in contrast to general state funding, between 1990 and 2001 funding for external contract research (excluding funding by national research councils) increased considerably, namely by 175 percent in the Netherlands, while the international average figure grew by 200 percent (AWT 2005, 45). Finally, between 1999 and 2001, commercial funding of university research in thirteen countries constituted, on average, 5.6 percent of their total research expenses (AWT 2005, 57).⁵

Of course, further differentiations are needed. Looking at different disciplines, we see that pervasive commodification occurs in the engineering, biological, and medical sciences, and, on a somewhat smaller scale, in the physical sciences.⁶ But commodification can also be found in the social sciences, be it more often in the form of contract research funded by governmental institutions. Moreover, even humanities disciplines may be involved, for instance in the case of historians writing corporate history or of philosophers of management and organization involved in consultancy work. Furthermore, differences between countries and their distinct research systems and science policies need to be taken into account. The literature available thus far exhibits a strong focus on the Western world and, more specifically, on science as it is practiced in the United States (although the latter focus is not always made explicit). Hence further studies of commodification and its impacts on academic research in developing countries remain especially welcome. Finally, in studying the phenomenon of commodification it is important to distinguish between incidental and more structural cases of commodification. In this sense, several of the trends described in this and the previous sections go far beyond the incidental in suggesting the rise of a pervasive entrepreneurial ethos and a structurally commodified academic culture.

The question of the novelty of academic commodification has also been studied, and disputed. A cautious conclusion is that the commodification of academic research is not strictly novel but has substantially increased and intensified during the past thirty years. For the purpose of this book it is pertinent to keep in mind the following two points regarding the issue of novelty. First, the claim that academic commodification has significantly increased and intensified during the past three decades does not at all imply that earlier academic science was in some sense

“pure” and unaffected by “social interests.” The latter view has been rightly questioned by many studies in the sociology of science, which have documented the role of cultural, social, economic, and military factors throughout the development of the sciences. Second, whatever forms of commodification may be found in the sciences of the past, present-day academic commodification constitutes a significant phenomenon and an important challenge. If philosophers want their endeavors to be of relevance with respect to the major issues of their times, they should try to meet this challenge by proposing and debating detailed analyses and assessments of, and sensible and viable alternatives to, the commodification of academic research.

The issue of the spread and novelty of commodification is addressed in more detail in several chapters. Kleinman speaks of a pervasive transformation of academic culture, but emphasizes that this is a long-standing process of intensification rather than a sudden break occurring, say, around 1980. Sterckx focuses on the more recent period and concludes that academic patenting and licensing have strongly increased: in the United States since the 1980s and in Europe since the 1990s. The chapter by Fuller deals with the issue of novelty from a broader perspective. Fuller acknowledges the current existence of a new level of commodification (to wit, epistemic capitalism) but sees it as emerging from earlier stages of commodification already started in the eighteenth century.

As for differences between disciplines, some contributions focus on the strong commercialization of the biomedical sciences. The chapters by James Brown, Leonelli, Resnik, and Musschenga, van der Steen, and Ho review existing cases and/or add new examples. Carrier gives a particular twist to the emphasis on biomedical science by arguing that the commercialization of this area is exceptional and not typical of other commercially interesting research areas. Furthermore, while many debates on commodification focus on the physical and biomedical sciences, Kunneman’s chapter explicitly addresses a wider range of scholarly inquiry, including research in the social sciences and humanities.

4. How to Assess the Commodification of Academic Research: Theoretical Issues

Given these forms of commodification of academic research and their substantial incidence, a natural question is how to assess these developments. This question has both theoretical and practical aspects. Theoretically, it concerns the issues of the legitimacy of critical assessment, and the nature and scope of the assessment

criteria. A shared premise of the contributions to this book is that such critical analysis and assessment of commodified science are both legitimate and necessary. In this respect, they contrast with two other approaches.

First, certain types of social scientific studies of academic commodification explicitly limit themselves to empirical and conceptual issues (even if, in practice, they function to support or legitimize developments toward commodified science). This seems to be the case with the well-known mode-1/mode-2 approach (at least with those parts of this approach that pertain to the issue of commodification).⁷ Although it is claimed that mode-2 knowledge production does not replace but *supplement* mode-1 and that its quality criteria are *additional* to mode-1 peer review standards (Gibbons et al. 1994, 14), the authors do not systematically examine the ways in which commodified science may, and does, *interfere* with mode-1 research and its quality criteria. In other cases, the new entrepreneurial ethos is explicitly endorsed as a somehow necessary historical phenomenon. In this vein, Henry Etzkowitz (2004, 69) claims that “the entrepreneurial university is an emergent phenomenon that is the result of the working out of an ‘inner logic’ of academic development that previously expanded the academic enterprise from a focus on teaching to a focus on research.” From such a perspective, critically questioning the commodification of academic research, and thus going against the “inner logic” of scientific development, must necessarily be pointless and a waste of time. Philosophically, such a deterministic account of historical development is highly questionable, which makes it all the more remarkable that Etzkowitz does not provide any argument to support his Hegelian claim.

Second, critical analysis and assessment of commodified science is sometimes rejected because it would be based on the empirically inadequate idea of the purity of science in a bygone era. In this vein, Philip Mirowski and Esther-Miriam Sent (2008, 635) accuse critics of commodification of “lamenting” and “bemoaning” the loss of an academic “prelapsarian Garden.” It is easy to see, however, that this sort of rhetoric—that pretends to disqualify an entire approach with one simple stroke—is inappropriate for two reasons. Firstly, the critics should have made the effort to provide explicit evidence for ascribing to specific authors a belief in an academic Fall; and secondly, as I emphasized in the preceding section, a critique of commodified science need not at all presuppose the existence of, and the wish to return to, a paradise lost. By way of comparison, Karl Marx’s critique of capitalist manufacture was certainly not motivated by a wish to return to a feudal means of production.

Thus there is no reason to denounce, and therefore ignore, the question of how to assess the commodification of academic research.⁸ Since we are obviously

dealing with an evaluative and normative question, answering it presupposes some account of what constitutes good science. Such an account may be specified in different ways. One may attempt to provide a philosophical specification of methodological, epistemological, and perhaps even ontological values in science, and judge the commodification of academic research on this basis. Alternatively, one may argue for a normatively desirable position and function of science in and for society, and try to derive political or moral criteria that can be used in evaluating commodified research. Thirdly, one may argue that social or moral norms and methodological, epistemological, or ontological norms cannot or should not be separated, and hence the first two approaches need to be combined.⁹

In all three cases positions regarding the normative evaluation of commodified academic research may vary from quite strong to more moderate. Strong positions imply arguments for universal or noncontextual criteria, while moderate positions emphasize the pragmatic and situated character of their normative assessments. Finally, a point mentioned before is worth restating here. That point is that criticism of commodified science is not the same as criticizing any use of science for social purposes. Hence critique needs to be complemented by serious consideration of the alternatives to commodified science. This subject will be addressed in the final section of this chapter.

The subsequent chapters of this book address a variety of theoretical issues concerning the evaluation of commodified science. Van den Belt argues for the significance of a normative, Mertonian ethos of science and defends this approach against the claims of exclusively descriptive or explanatory accounts by economists and sociologists of scientific knowledge. Leonelli's analysis emphasizes the importance of key methodological values, such as equal access to resources, competition between different methods, and a long-term vision. Carrier employs methodological criteria (such as requirements for unification, causal analysis, and reciprocal control of prejudices) in his evaluation of the relation between epistemic and applied research. James Brown criticizes the lack of epistemic justifiability of what he dubs "one-shot science," of which commercialized, randomized clinical trials—that is, trials that are often called the gold standard of evidence-based medicine—are a prominent illustration. In addition to pointing out cases of methodological bias, Musschenga, van der Steen, and Ho question the ontological assumptions about the nature of human beings underlying psychiatric research that exclusively focuses on drugs.

From his analyses of neoliberalism and Marxism, Fuller concludes that commodification is "still evil even if necessary." Underlying his assessment of academic commodification is his normative sociopolitical vision of a republican university,

a vision that is discussed in detail in Mark Brown's contribution. Brown also provides an extensive discussion and evaluation of the important distinction between "coercion" and "corruption" arguments against academic commodification: whereas coercion arguments focus on the structural effects of unequal power relationships, corruption arguments address the impact of commodification on the epistemic, social, and moral values of academic culture.

Mixed philosophical and sociological approaches can be found in Kunneman's proposal for a "mode-3" approach (a specific kind of humanized mode-2 social science, which consciously aims to advance both a critical academic culture and social responsibility) and in my own arguments for combining general moral or institutional values and more specific epistemic or methodological norms. Finally, an explicit mix of epistemic and ethical norms is advocated in Resnik's contribution.

5. How to Assess the Commodification of Academic Research: Practical Issues

In addition to the theoretical issue of the legitimacy of critical analysis and the nature and scope of its criteria, there is the issue of how to assess the actual practices of commodified academic research. Some emphasize its advantages. Universities become less dependent on the shrinking funding by government agencies. Commodification enables the orientation of academic research toward technological advancement and socioeconomic priorities. Research policies will be more flexible and more attuned to actual developments. Competition between public and private research will induce universities to seize opportunities for innovation more quickly. An underlying argument is that linear models of innovation are seen to be inadequate (see Grandin, Wormbs, and Widmalm 2004). In such models, innovation takes place in a fixed temporal order: from basic research to applied science, product development, marketing, production, and end-use. More recent accounts of innovation, however, emphasize the more-or-less permanent interactions and feedbacks among universities, industry, and government (Gibbons et al. 1994; Etzkowitz 2004; see also Carrier, this volume, chap. 8). From this perspective, it is only natural that industrial and governmental contractors be involved in academic research from an early stage and steer its direction and content in significant ways.

At the same time, these developments have evoked critical responses. Such critical voices have not only been raised by philosophical "outsiders," but at least as strongly by established scientists and academic administrators. It is a telling sign

when a former president of Harvard University, Derek Bok (2003), publishes a fairly critical book about the commercialization of American universities. Equally significant is the fact that, since 2001, a large number of prominent biomedical journals require that their authors make public any ties to external funding bodies, and even demand them to sign a statement saying that, if such ties exist, the sponsors have not influenced the methods or contents of their research.

In assessing the commodification of academic research, the following subjects need to be taken into account. *First*, commercial interests may have an undesirable impact on research methods and their results. A consequence may be that, from a methodological or epistemological perspective, the research designs may be less than optimal, and the results of this research biased. *Second*, commercial motives may lead to a higher level of secrecy than would otherwise be the case, and thus could slow down the overall advance of science. This could, for instance, happen because of the specific requirements of the patenting system or because of the secrecy policies of private firms. *Third*, generally speaking, commodification will be detrimental to those areas of academic inquiry that are seen to be useless from the perspective of economic instrumentalization. This problem will be amplified in a situation of decreasing government funding. Here we should not just think of ancient history or medieval philosophy but, for example, also of those medical and health care approaches that do not focus on the use of drugs or other profitable technologies. *Fourth*, commodification tends to lead to a narrow orientation focused on short-term achievements and results. Hence it will be much more difficult to start and develop long-term projects, even if they might be more socially beneficial in the long run. *Fifth*, there is a variety of legal, moral, and philosophical questions about the patentability of the results of academic research. In particular, questions have been raised about the recent extension of patent law and practices to the “knowledge” generated by the biomedical sciences.¹⁰ *Sixth*, there is the problem of potential abuse of public funds for private purposes. In the case of a researcher who simultaneously works for a public institute and runs his or her own business, the incidence of this kind of abuse seems to be more probable than not. A *seventh* important issue pertains to the measure of public trust in science. Commodification, in particular the highly publicized, dramatic cases of commercial abuse of science, may erode the public trust in science more generally. In view of the indispensability of science and science-based technology in present-day societies, the consequences of a waning of public trust in science may be considerable. The *eighth* and final point is the general issue of the justifiability of the privatization and economic instrumentalization of public knowledge. Is it just that private parties own and exclusively profit from scientific results that are in

fact a collective achievement, built on an immense amount of publicly funded research results?

All chapters of this volume address one or more of these eight issues. The authors offer varying assessments of the merits and problems of commodified academic research. While none of them sees commodification, in an evaluative sense, as entirely unproblematic, or as more or less neutral, the interpretations of its problematic aspects differ. As we will see in the next two sections, these differences are reflected in different preferences for either regulation of, or alternatives to, commodified science.

The possible impact of commercial and financial interests on the epistemic quality and advance of science is a prime theme in the chapters by Resnik, James Brown, Musschenga, van der Steen, and Ho, Leonelli, and Carrier. Carrier also discusses the occurrence of secrecy in commercialized science and argues that it is being compensated for by counteracting mechanisms that favor openness (such as the need for cooperation with academic scientists in the application of public knowledge by commercial researchers). Musschenga, van der Steen, and Ho discuss and criticize the marginalization of ecological and nonbiological approaches to mental illness, a point that is addressed from a more general perspective in Kunneman's chapter. The issue of the short-term focus of commodified science is discussed in detail in Leonelli's contribution. She shows that private sponsorship encourages short-term, "product-driven" competition, while public sponsors tend to promote a longer-term, "resource-driven" competition, and she highlights the negative consequences of this type of commodification for the disclosure, circulation, and retrieval of data in the biomedical sciences. The practice of academic patenting and licensing is analyzed in detail by Sterckx. She discusses several undesirable and paradoxical consequences of patenting and licensing, and shows that the proposed economic justifications of this practice are more often than not based on rhetoric rather than reality. My own later chapter advocates a neo-Mertonian ethos of science, demonstrates that this ethos is often explicitly endorsed by established ethical codes of scientific conduct, argues that academic patenting goes against this ethos, and hence concludes that such patenting is unjustifiable. The private abuse of public research, the decrease of public trust in science, and the general justifiability of privatizing the fruits of academic research constitute important issues in the contributions by van den Belt and Fuller. Van den Belt argues for the lasting importance of the view of scientific knowledge as a "non-excludable and nonrival public good." In line with this, he advocates a revival of the Mertonian ethos of science, which is endangered both by the commodification of academic research and by proponents of reductionist and antinormative

sociological approaches to scientific development. Finally, on the basis of subtle differences in the interpretation of the notion of commodification, Fuller explains and illustrates the harm done by commodification to the integrity of both knowledge producers and knowledge consumers. More generally, like Kleinman, Fuller perceives the mission of academic institutions as educating for citizenship instead of educating for the market.

6. Regulating Commodified Research

We may safely conclude that, at present, the problems of the commodification of academic research sketched in the previous section are broadly acknowledged. Yet, differences remain concerning the seriousness of these problems. Obviously, the urgency of looking for solutions and the extent to which advocated alternatives will deviate from the present situation will depend on whether commodification is seen to be a structural or a more incidental issue. In the latter case, solutions will primarily be sought through regulation.

For instance, in April 2008, Dutch newspapers carried a brief debate on the issue of special professorships and ordinary chairs financed by external organizations. In the Netherlands, a survey concluded, about 25 percent of all 5,481 university professors are paid by external organizations (see Persson and Rengers 2008). The major sponsors are commercial businesses (27 percent) and health care organizations (25 percent). One of the examples of commodification pertained to a professor at Wageningen University with an expertise in the area of dairy products. This agricultural scientist recently argued that drinking milk is beneficial to our health. Yet, what neither he nor his department made explicit is the fact that his chair is paid for by a national organization of dairy farmers and that he himself is one of the directors of a large dairy company. By many observers, the main problem was seen to be the lack of public information about the ties of such professorships to their sponsors. In the debate that followed, different views were taken about how to regulate this specific problem. The minister of education, for instance, suggested that making the information about the nature of the professorships public should be compulsory, while the Association of Universities in the Netherlands countered that this should be decided by the universities themselves.

More generally, public information and transparency about financial bonds is often seen as *the* solution to this kind of problem (Montgomery and Oliver 2009, 146–49). Yet, in a more comprehensive analysis, it proves to be questionable whether this is really the case.¹¹ Suppose you have been asked to review a paper for

a journal and the author or authors (for instance, the above-mentioned dairy specialist) have properly declared their funding sources. The critical question, then, is what to make of this information? If you assess the paper's merits and problems in the usual way, the additional information about the authors makes no apparent difference. But if you decide that, because this information must have some significance, the paper requires a more scrupulous review and a more critical assessment, you effectively presuppose that, generally speaking, commodified science is more liable to bias. Furthermore, if the paper is published, its readers will find themselves in a similar predicament. Hence, in such cases, making financial ties public merely makes explicit, rather than solving, the problems in question. After all, the usual and more appropriate procedure in instances of a conflict of interests (for instance, in journalism, politics, and law) is to withdraw completely from the cases in which one is personally involved. It is hard to see why this should be different in science.

Apart from compulsory directives imposed through governmental policies, regulation may also be realized through devising and implementing ethical codes of good scientific conduct. In fact, during the past decades, a variety of such codes have been adopted or updated, in part for the purpose of coping with the issues of academic commodification (Kourany 2008; Montgomery and Oliver 2009). Usually, such codes consist of a number of principled statements, but frequently they also include a variety of mitigating qualifications of these statements. This means that these codes, depending on how the principles and qualifications are interpreted and used, may either function as instruments for regulating incidental problems of academic commodification or as vehicles for addressing its more structural problems. In the latter case, the basic ideas and criteria of the ethical codes should not merely be applied for sanctioning the behavior of individual scientists (as is the most common approach at present), but should also be structurally incorporated in the science policies of academic institutions and governmental agencies (see Radder 2009).

Most chapters of this book include or imply some suggestions for regulating the commodification of academic research, but some authors discuss or provide more extensive regulatory proposals. Sterckx, for example, concludes her analysis of academic patenting by suggesting a variety of regulatory measures that should be implemented at three different levels: an international, a national, and a university level. Similarly, Resnik offers a list of recommendations for counteracting the negative impact of financial interests on the norms of science. From a more general perspective, Carrier and Musschenga, van der Steen, and Ho argue that a substantial level of public funding is needed to compensate for the negative con-

sequences of commercialized science. Finally, Mark Brown discusses several policy reforms that aim to correct the unequal distribution of power that often exists between academic researchers and dominant commercial contractors. The underlying idea is that researchers should be free, rather than coerced, to decide whether or not they will market their results.

7. Alternatives to Commodified Science

The last of our central research questions addresses the potential alternatives to commodified science. Which alternatives to commodified academic research are philosophically and socially justifiable and practically viable? Theoretically, we may distinguish between three ideal-typical models: commodified science and the alternatives of autonomous and public interest science.

A model of commodified science is provided by Etzkowitz's account of the entrepreneurial university, in particular by what he calls the "third mission" of this emerging type of university (Etzkowitz 1998, 2004). The core of this mission is the contribution to economic growth or the "capitalization of knowledge." Important elements are the external exploitation of university research through protected intellectual property, the incorporation of commercial firms within a university, and the creation of new university-industry research centers. A related account has been developed by John Ziman, who speaks of postacademic, or industrialized, science. According to Ziman (2000), postacademic science aims for proprietary knowledge; it focuses on local, technical problems; it is performed under managerial authority and commissioned for practical purposes; and it employs experts in the sense of specialized problem solvers.

In view of the structural problems of commodification described in the preceding sections, consideration of alternatives becomes a pertinent challenge. Is there a preferable model for performing academic research, both from a methodological or epistemological and from a social or ethical perspective? If so, what are, or should be, the alternative ideas guiding the desirable behavior of academic researchers and the preferred institutionalization and organization of academic research? In response to these questions, I will briefly consider the models of autonomous and public interest science.

The model of autonomous science is often associated with the name of Robert K. Merton, who proposed an influential account of an independent scientific community characterized by universal social-epistemological criteria, common ownership of research methods and results, disinterested review procedures, and

a critical attitude toward all scientific claims (Merton 1973/1942). Of course, proponents of such a model may and do add certain qualifications, for instance that the model should be seen as an ideal-type or that it is intended to be partly normative. In view of such qualifications, “autonomy” should not be taken in an absolute sense, and “autonomous science” not as an empirical reality. For this reason, more cautious characterizations may be preferable, for example the idea of a “self-governing science” (Polanyi 1962) or even the notion of a nonneutral, “self-interested science” (Pels 2003).

The basic idea of the model of public interest science is that science should, primarily, contribute to a lessening of human suffering and an increase in human well-being. Under present circumstances, however, there is a major, structural divide between those who do, and those who do not, benefit from the fruits of academic research. An exemplary case is the contrast between the vast resources spent on medical research into relatively minor or rare complaints in Western countries compared with the small efforts devoted to studies of frequent and serious diseases in developing countries. For this reason, the task of public interest science is to acknowledge a much wider array of social problems and to contribute toward relieving or solving these problems. Thus, public interest science differs from autonomous science by incorporating social goals, at least institutionally but sometimes also methodologically, and it differs from commodified science in embracing a much broader range of social goals than merely economic ones. Some proponents of public interest science (e.g., Krinsky 2003) take the notion of a public interest to be more or less clear or focus on issues that are generally (or at least widely) agreed to be of public interest. More sophisticated approaches include procedures to find out which types of issues legitimately count as “of public interest.” These approaches are often based on principles of equality, democracy, and justice. Examples include Philip Kitcher’s arguments for combining the search for (significant) truth with the claims of democracy (Kitcher 2001) and Steve Fuller’s plea for a republican science in an open society (Fuller 2000). Fuller’s concept of a republican science, with its emphasis on democratization and its leveling of expert and lay contributions, represents a radical public interest approach. A detailed discussion and evaluation of the political philosophy of republicanism and its application to the problems of the governance of science can be found in Mark Brown’s contribution to this volume.

As is illustrated by the case of Kitcher, the models of science advocated by specific authors may also be hybrids that include elements of the distinct ideal-types explained thus far. And indeed, this makes sense if we agree (as I think most authors of this volume do) that academic research does possess specific character-

istics that deserve to be fostered and protected, that contributions of science to economic development are in principle legitimate, and that science ought to be used for battling human suffering and promoting the well-being of humanity. The challenge, then, is to make explicit the extent to which, and the conditions under which, elements of each of these models legitimately apply.

Several of the chapters of the book try to meet this challenge. Inspired by Merton's ideas of autonomous science, van den Belt advocates a truly meritocratic but open science, which aims at improving and expanding a commons of knowledge. In arguing for a structural incorporation of a deflationary, neo-Mertonian ethos in academic institutions and science policies, my own later chapter develops a congenial approach, but also intends to make a connection to the model of public interest science. Kunneman's mode-3 approach similarly insists on the value of academic criteria but simultaneously includes elements of the public interest model.

NOTES

1. For analyses of teaching and administration, see Bok (2003); Slaughter and Rhoades (2004), and Lorenz (2008); the first two books also discuss the U.S. university sports programs.

2. In part, my discussion draws on material published in Radder (2003).

3. Note also that the definition of commodification in principle allows for the occurrence of "noncommodified industrial research," namely in those cases where industrial research is not dominated by economic interests. For instance, in the period between 1947 and 1972, industrial researchers at Philips electronic laboratories were relatively free from direct commercial pressures (de Vries 2005).

4. As for books and edited volumes, see Köbben and Tromp (1999); Shulman (1999); Sterckx (2000); Grit (2000); Bok (2003); Kleinman (2003); Krimsky (2003); Angell (2004); Grandin, Wormbs, and Widmalm (2004); Slaughter and Rhoades (2004); Healy (2006); May and Perry (2006); and Resnik (2007).

5. Further relevant data can be found in Slaughter and Rhoades (2004) and in the chapters by Kleinman, Sterckx, Resnik, and James Brown. As I emphasized before, we have to bear in mind that direct financing by commercial firms is only one of the many forms of commodification. It is also important to realize that, due to national differences in definitions of research categories and variations in research systems, the acquisition and interpretation of aggregated international data are far from straightforward.

6. For some recent case studies of microphysics, nanotechnology, medical science, and biological science, see, respectively, Mody (2006); Thurs (2007); Cooper (2009); and Sismondo (2009).

7. Very briefly, traditional or mode-1 research is claimed to be autonomous, academic, disciplinary, and methodological, while the more recent mode-2 knowledge is characterized by taking place in application contexts, by being commercialized and transdisciplinary, and

by essentially including social criteria of accountability and quality control. See Gibbons et al. (1994). For critical reviews and assessments, see Weingart (1997), and Hessels and van Lente (2008).

8. For detailed, positive arguments supporting the legitimacy of philosophical critique and normativity, see Radder (1996, chaps. 5 and 8) and Radder (2003, 21–24). See also Lock and Lorenz (2007, 413), who write, “If . . . the role of the university is to provide a sphere in which genuinely critical thinking, investigation and debate can take place, it would follow that university research cannot take the form of a mere response to ‘societal demand,’ nor university teaching that of ‘textbook transmission.’”

9. For further discussion of the role of different kinds of values in science, see van der Steen (1995); Resnik (1998); and Carrier, Howard, and Kourany (2008).

10. In addition to their political and moral significance, the theory and practice of (academic) patenting constitutes a genuine gold mine for intellectually challenging research on basic philosophical issues (cf. Radder 2004; van den Belt 2009, section 3).

11. See also Schipper and Bojé (2008), who emphasize that transparency does not necessarily entail integrity.

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