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“Open Access”

Challenging some popular assumptions

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I “Open Access”: the problem

You don’t want to simply download music files and videos, you want to have easy access to texts of all kinds on the Internet, download them to your computer, then print them out at no charge — and you don’t really care whether or not the author of the text, literary person or scientist, is still alive — the main thing is that your downloading pleasure isn’t spoiled by the living author (or the descendants of an author who is no longer with us) causing legal problems for you; and that’s why you are so enthusiastic when you hear that Google, in a joint venture with major scientific libraries, started digitising all these libraries’ available books and journal articles (written by authors both dead and alive) a few years ago; and Google’s ‘Book Search’ will not only enable these works to be researched, but in many cases the full text version of the digitalised book or article will also be made available; what Google is doing, you say, should . . . , must also be done by the scientists working in Germany, the scientists whose existence is subsidised by the taxes you pay; so that they, as scientists in tax-financed state employment, put what they have thought of and written about on the Internet in digital form — at no cost to yourself, of course, so that you can deservedly draw some benefit from all the tax money you’ve contributed to science . . . you’ve heard that this idea has a name . . . “Open Access” . . . and you think it’s a marvellous idea.

How pleasant this world would be if one could always have, without having to give. A world like this, however, does not exist. If you want to have, you must give, and if

you want to have something free from the Internet, you must pay for it, both with money and with invisible moral capital, which is exhausted in the Internet much faster than the false Internet apostles care to admit.

Let us dwell for a moment on the moral concepts behind the Google "Book Search" and the "Open Access" movement. By this, I do not mean their vivid 'show' pages, which address the Internet user in eye-catching manner, visually calling out "Come, log in, friend! I'll give you the knowledge of the world in digital form — it's user-friendly and free! Use it to improve the lot of mankind!" No, what I'm talking about is the dark side of the Google Book Search and the "Open Access" movement; both of these can only exist by first using robbery and blackmail to take a text from its author. Then they lay the booty at the feet of Internet users and maintain that the text was a gift. Robbery and blackmail, however, are not legal in a constitutional state. They can never be morally approved, because they replace a relationship built on freedom between human beings with one born of coercion and strong-arm tactics, in which the more powerful bends the weaker party to his purposes.

It didn't interest Google whether or not the authors of the books taken from library shelves and put under the scanner were alive or dead — no, all that mattered was the digitising of library stocks for the good of humanity. And it's because this didn't interest Google that it carried on digitising books, without getting the permission of the living authors or dead authors' copyright holders, thereby violating valid German and European copyright law — and very probably American copyright law as well. They have broken the law with calculated intent in millions of cases, simply to gain a market advantage — and they continue to do so.

The "Open Access" movement is not one whit better. In

contrast to Google, "Open Access" does not intend to digitally process all the literature of the past; its aim is to make current and future scientific literature available free of charge for all Internet users, and, as the saying goes, "with no legal barriers".[1] In order to achieve this, university management at the local level and at the national level research promotion institutions (which finance so-called third-party-funded projects in the universities) pressure the scientists to make their publications available via "Open Access" — and they do this quite openly.[2]

Apparently they find it normal to publicly ignore that noble phrase, "the freedom of the sciences" — and although it is a fundamental right defined by law, they choose to ride roughshod over this freedom and over the valid copyright laws for scientists, using cold and unfeeling administrative channels as powerful steeds. This is quite simply a scandal — and it should be shouted from the rooftops!

[1] The Budapest Open Access Initiative states: "By 'open access' to this [scholarly and scientific] literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself." See http://www.soros.org/openaccess/read.shtml.

[2] The most strikingly infamous example of this is still the paper by the DFG (German Research Foundation) Sub-Committee for Electronic Publishing. Published in 2006 under the title "Elektronisches Publizieren im wissenschaftlichen Alltag" (Electronic publishing in day-to-day science), one paragraph on p. 3 states that "External incentives could reinforce the inclination of many scholars to publish their works electronically. The executive boards of universities could exercise a certain amount of (institutional) pressure, but they have until now been somewhat reticent in actively propagating electronic publications." One need only read between the lines here to discover all the nasty nuances inherent in this paragraph — and the sheer power of its potential for burocratic implementation.

Seeking to raise the political stakes, the "Heidelberger Appell"[3] did just that — because universities and research funding institutions like the DFG, the Leibniz Association and many more — all 100 % state-financed — must not be permitted to oppose the very cornerstones of our society's fundamental rights by taking refuge in the complex jungle of day-to-day academia, while claiming to be "shaping the future" and even expecting acclaim for doing so. Once and for all, it must be made absolutely clear that this kind of 'future shaping' is directed against our constitution and the values upon which it was founded — thereby delegitimizing it.[4]

In order to emerge unscathed and arrogant from this calamity, the digitising community likes to claim that our basic rights and the laws of copyright were of a medially different era, during which it may have made sense to protect authors; today, however, other media exist — media which have necessitated 'communitarian' legal forms, in which works published by authors no longer require protection by copyright. This is not just an 'easy way out' — it is much too easy. They slither without further ado from the present state into their 'desired state', only slightly acknowledging such arrangements as the laws which legally codify the currently prevailing or heralded conditions. This amounts to a legally-cloaked and uncritical acceptance of the given conditions and negates the potential of the law to criticise by confronting that which is with that which should be.

What remains to be done here is to firmly assert that law does not eo ipso mean acceptance of what everyone is doing

[3] The article in the Appell, together with a list of signatories, is on the Internet at http://www.textkritik.de/urheberrecht/index.htm.

[4] See Reuß: "Eingecremtes Publizieren", Jochum: "Im Namen der Freiheit" and Rieble: "Forscher sind nicht normale Angestellte".

or wishes to do, but rather of what everyone *should* be doing.[5] This is why ethics and the law are present on the Internet — they have not yet become technically obsolete in the Internet domain, where a thief and blackmailer who avails himself of the Internet remains a thief and a blackmailer.

This is when the Google and Open Access apologists shift the focus of their arguments from morals to money. Science, they say, is expensive; and will become considerably less expensive thanks to electronic publishing as envisioned with "Open Access" as a standard. The general public has until now been paying several times over for one scientific publication: it finances the scientist and his institute, then subsidizes the printing costs for the publications via research funding institutions and finally finances the purchase of the publications through a university library or institute library, or both. This occurs several hundredfold for every publication in Germany. If state-financed science would take over publishing and oust the commercial publishers from the publishing chain, scientific publications would become less expensive. There would be no more need for investing in a long publication chain. Investments would then be made in the electronic publication service of the full text server into which scientists would merely feed their works. Any interested party could then fetch the texts free of charge, without having to surmount legal barriers. In a nutshell, they claim that this would be a sensible organisation of science for society as a whole, one which scientists would have to submit to; not due to pressure, of course, but simply convinced by good reasons.

But what if these reasons were not good at all? Then the

[5] This could also be expressed in the categorical imperative form: "Act so that the maxim of thy will can always at the same time hold good as a principle of universal legislation." Kant: *KdrV*, chapter 1.

force factor would once again emerge from their midst. And this is exactly the case.

Firstly, there is a passage in copyright law which contradicts the 'socially sensible' organisation of science desired by the "Open Access" movement. This passage refers to the fundamental right of freedom for science and research anchored in the constitution.[6] It reads: "The author shall have the right to decide whether and how his work is to be published."[7] The advocates of "Open Access" hence scheme to get rid of this passage, at the very position where the constitution places the scientists' right of self-determination above the whether, how, when and where of their thinking and publishing — and they want to replace it with the radically different right of science consumers to unconditionally appropriate the thoughts and writings of others. They claim that the right of the public to have free access to scientific publications (in digital form) overrides the rights of an author, even those of a scientific author.[8]

[6] German constitution, art. 5:, sec. 3, item 1: "Art and scholarship, research, and teaching shall be free."

[7] German copyright act, art. 12, sec. 1.

[8] German copyright act, art. 11: "Copyright shall protect the author with respect to his intellectual and personal relationship with his work, and also with respect to utilization of his work."
Rainer Kuhlen, one of the most ardent supporters of a new "Open Access"-compliant copyright law, and "UNESCO Chair in Communications" interprets art. 11 thus: "Copyright law shall serve the promotion of culture, art, education and science, ensuring the authors of creative works time-limited rights which may not obstruct public objectives [sic]. The moral rights of the author do not contradict the public objectives in any way. Yet no implicit exploitation rights can be derived from them." He continues: "Exploitation rights can neither be exclusively claimed by scientific authors nor can they be ceded for commercial purposes." As cited in Kuhlen: *Erfolgreiches Scheitern*, pp. 582 sq. The Alliance of German Science Organisations (Allianz der deutschen Wissenschaftsorganisatio-

This poses the question whether or not this model of common public appropriation of science is doomed to fail, simply because it regards science as a mere electronic pool of publications, accessible free of charge and without legal hindrances, without even considering the conditions which must be fulfilled in order to fill this pool with science in the first place. This reveals once again the logic of force, thinly veiled by the attempt to implement compulsion as a public and semi-democratic force where the majority of science consumers believe they have the right to dictate the terms under which the minority of science creators has to work. The removal of the rights of scientists for the sake of making science less expensive blunts the very impetus which has made it possible since the time of the pre-Socratic thinkers: the right to self-determination. This freedom has always been expensive, no matter what the man in the street believes.

Secondly, it should be realized that relevant literature about "Open Access" has been almost exclusively written by exponents of "Open Access". A critical debate on the questions posed by "Open Access" was only triggered by the "Heidelberger Appell" article. This also applies to the claim (never criticised by the "Open Access" circles) that "Open Access" offers a more reasonably-priced publication model than the traditional intermeshing and interaction of scientists, publishing houses and libraries. When an attempt is made to get to the bottom of this implied claim by "Open Access" of less expense and, in consequence, 'more sensible societal organ-

nen) makes use of such pioneers when in its statement condemning the "Heidelberger Appell", it writes that "The Alliance of German Science Organisations demands a form of publication free of charge (Open Access) to the reader of purely scientific research results attained by the use of public funds — and which consequently have been produced for the general benefit of research and society." See "Open Access: Gemeinsame Erklärung der Wissenschaftsorganisationen vom 25. März 2009".

isation of science', the claim is totally negated … nothing remains of it. The following pages shall prove this.

II "Open Access" — is free of charge

Since the advocates of "Open Access" claim that "Open Access" provides the tax-paying collective (the consumers of science) with this science free of charge,[1] we should at first clarify this aspect and ask ourselves what is actually meant by "free of charge".

"Free of charge" can mean that something is indeed available at no charge, as in the case of renewable raw materials or of gifts. However, it could also mean that we do not have to pay for using something, but that we do have to pay for its existence. A case like this is termed "usage free of charge". "Open Access" is exactly this type of "free of charge" entity, and no less than that august body, the "Alliance of German Science Organisations" (Allianz der deutschen Wissenschaftsorganisationen) emphasized this when it demanded "a publication of scientific research results free of charge for the reader (Open Access)".[2]

In short, "Open Access" operates cost-wise and technologically in exactly the same manner as motorways — they can presently be used free of charge but they actually cost the taxpayer enormous sums of money. This is balanced through tax transfers conducted behind the taxpayer's back. Whoever

[1] The German information platform on "Open Access" clarifies this: "Access to Open Access content is globally free of charge. This means, for example, that even people in the poorer countries (for whom access is impossible due to the lack of financial means) will have access to, and the use of, scientific information."

[2] "Open Access: Gemeinsame Erklärung der Wissenschaftsorganisationen vom 25. März 2009".

believes that “Open Access” is a functioning model of the free publication of science must be aware that it is just one more “usage free of charge” model, the associated costs of which must be borne by the taxpayer, at least in those segments of science found in state universities and research institutions which represent the major part of research in Germany.

This becomes crystal clear when one focuses on what “Open Access” describes in new-speak as a “business model”.

III "Open Access" as a Business Model

The term, "Business Model" not only suggests that "Open Access" costs less than the usual scientific documentation publishing methods — and is consequently less of a burden on the taxpayer — it also implies that one can earn money with it. However, if you go through the list of "business models", which the German "information platform open-access.net" has put together,[1] you will see that these "business models" aren't money earners at all ... they are subsidised models. They function in such a way that science authors must pay a publication fee to finance the upkeep of the full text server or electronic "Open Access" journal through which they wish to publish their texts. I shall provide a detailed description of how this works later in the book. For now, an overview of the economic character of the payment fees will suffice:

- Author-financed "Open Access" model: here authors pay the "Open Access" publishing fees. However, since most authors in the scientific world are associated with universities and research institutes, these organisations pay the costs for this model — and if the university or research institute in question is state-controlled, the taxpayer ends up paying the publishing fees.
- Financing through a funding organisation: When the DFG (German Research Foundation) authorises a research project, the creator or author of that project receives a lump sum of € 750 a year for publishing —

[1] http://open-access.net/de/allgemeines/geschaeftsmodelle/.

and this sum can be used to pay "Open Access" fees. Since the DFG and many other funding bodies are state-controlled, it is the taxpayer who has to foot the bill for publishing fees.

- Institutional membership: when a research institution or university becomes a member of an "Open Access" platform or journal, those associated with that institution or university may publish their literary works as "Open Access" contributions, either at no cost whatsoever or at reduced prices. Since these research institutes and universities are mostly financed by the taxpayer, the taxpayer also pays the publishing fees.

- Publishing funds: several scientific institutions have created publishing funds for their scientists who receive no funding. "Open Access" fees are then paid from these publishing funds. Since these scientific institutions are usually financed by the taxpayer, the taxpayer again pays the publishing fees.

- Hybrid financing models: here the costs for "Open Access" are distributed between the subscription fees for a printed or electronic journal and "Open Access" fees for the publishing of contributions in the electronic version of the same journal. Since the system in these models involves the payment of subscription fees by the library, and the "Open Access" fees are either paid by the library or a fund or a funding institution — all financed by the taxpayer — the taxpayer once again ends up paying the publishing fees.

- Community Fee model: in this model, a scientific community pays the publishing costs, e. g. the German Association of Mathematicians pays for publishing

"Documenta mathematica". Financing then takes place through the membership contributions of the individual organisations.

- Institutional sponsorships: here a scientific institution takes the role of publisher, in that it prepares the electronic documents itself and bears the costs for these, either wholly or partly. If this institution happens to be a state university or other state research institution, the taxpayer also pays these publications — so public money also finances the institutional publisher. If the scientists in this model bear a part of the publishing costs themselves, they do not pay these out of their own pockets — they are paid through university chair or library funds, which are in turn funded by the taxpayers.

- Combined financing models: even if all these models are mixed with one another, the taxpayer always bears the costs of publishing the literature available to him, with the exception of the "Community Fee Model".

- Consortial business model: only one of these models is currently being tried out, in the particle physics segment. And even the operators of the "Open Access" information platform are very aware that this model cannot be transferred to other scientific segments.[2] If it were transferable, this model would also be one of those where the taxpayer has to bear the brunt of the costs (together with the part financed by professional associations through their membership contributions).

- Other financing possibilities: cross-financing through

[2] Ibid.

> the sale of the printed versions of the electronic "Open Access" documents is apparently possible. And it is quite clear that some "Open Access" journals "are very dependent on the commitment of their honorary operators — a commitment usually nourished by some kind of institutional infrastructure. When the number of publications increases, however, this method can become impractical, or it must at least be flanked by a combination of financing models, where available."[3] What is described here as a business model is actually only a subsidised model, financed by the transfer of taxes from the general public and — we may assume — enabled through the honorary work of the operators, after the standard self-exploitation of individuals from the publishing and scientific communities who are committed to the project has taken place.

A report by the Kaufman-Wills Group makes it absolutely clear that this "business model" does actually behave in this way — and "Open Access" circles like to parade this as evidence that "Open Access" business models are indeed possible.

The report states that "41 % of Full Open Access journals operated with a shortfall, compared with 24 % that broke even, and 35 % that made a surplus. In other words, only slightly more than half of open access journals (59 %) were operating in the black."[4] The second sentence here illustrates an interesting interpretation of economic processes, because it transfers the "Open Access" journals which earned nothing, to the successful 35 % of "Open Access" journals which actually made a profit.

[3] Ibid. [4] Kaufman-Wills Group: *The facts about Open Access*, p. 10.

The journals which do not make a profit must however be transferred to the 'losing' side, because if you don't make a profit, you can't renew your infrastructure — and you'll sooner or later join the ranks of the businesses that disappear from the market. It's plain for all to see that two thirds of the "Open Access" journals (65 %) do not make a profit — and therefore should not be able to survive on the market. The fact that they still exist is not thanks to their own economic strength, but to the subsidies they receive.

This must be the case, because if 47 % of the "Open Access" journals do not charge a publishing fee,[5] then we're not discussing a functioning publishing economy here, we're describing subsided models for publishing.

Within the framework of subsidised models like this, a great range of possibilities can be tried out — and these models do not have to balance their books properly, simply because they have public tax funds at their disposal.

Add to this the fact that the profit-making 35 % of "Open Access" journals only make a profit because the publishing fees the individual journals charge are covered by public tax money. So what would appear to be profit, suggesting independent survival on the market, is nothing other than tax-financed survival, which gives the impression of self-sustainment through market processes and in-house financial strength.

The "Open Access" portal "German Medical Science" (GMS) shows just how this transfer of taxes can be presented in the guise of a business model.

The portal was paid for by the DFG from 2002 to 2006, financed by project sponsors and professional associations in 2007 and from 2008 was meant to cover its own running

[5] Schmidt: "Geschäftsmodelle des Open Access-Publizierens", p. 291.

costs.[6] What this really means is that for five years GMS was fully financed by public taxes and since 2007 has mainly been kept alive by public tax money — because two of the three project sponsors are in fact state institutions financed by public funding.[7]

Only in 2010 are costs supposed to be mostly offset by revenue[8] — but whether these costs can ever be wholly offset is questionable, so if a "partial refinancing" is at least achieved, the GMS operators will be content.[9]

Against this backdrop, it is indeed euphemistic to say that the "financing of 'Open Access' portals represents a challenge."[10] This conceals the fact that all "Open Access" projects depend on the taxpayer either financing the publishing fees of commercial "Open Access" platforms, or subsidising the institutional (state) "Open Access" platforms. Whatever way you look at it — it's the taxpayer who foots the bill.

Here — and this is always the case with tax-financed projects — much that is tested and tried freely (with no risks attached thanks to the transfer of taxes) will be as dead as dead can be when the project money runs out (and very often even before this event takes place).

It is therefore hardly surprising that a quarter of the journals listed in the "Directory of Open Access Journals" seldom produces an article, or is classed as being "inactive".[11]

[6] Roesner: *Open Access Portale und ihre Etablierung am Markt*, p. 50.

[7] Viz. the Central Library for Medicine in Cologne and the German Institute for Medical Documentation and Information (DIMDI). The third project sponsor is the Association of Scientific Medical Societies.

[8] Roesner: *Open Access Portale und ihre Etablierung am Markt*, p. 51.

[9] Ibid., p. 52. [10] Ibid., p. 58.

[11] This was the situation in 2005, with a quarter of the journals inactive, see Schmidt: "Geschäftsmodelle des Open Access-Publizierens", p. 291, Rem. 5. More recent figures are not available.

The time has come for us to take a closer look at the "Open Access" economy which is financed by tax transfers — and to verify if there is any truth behind the statement of the "Open Access" apologists, that "Open Access" offers a cheaper publishing model than paper and library-oriented scientific publishing (also financed by public taxes) for our society as a whole. The word "cheaper" here is a misnomer, by the way — a publishing system can only cost less if it can make do with less transferred taxes and consequently fewer subsidised payments.

IV “Open Access” is cheaper

There is a simple reason why no one has yet made the effort to take a critical look at the ‘cheaper’ “Open Access” model calculations — because at first glance it seems highly plausible that a publishing system in which the scientists upload their publications online to full text servers, or where they publish them in electronic scholarly journals (and all in do-it-yourself style) must be cheaper than a publishing system involving books and journals produced by publishing companies in personnel-intensive manner. And those books and journals have to be archived by libraries, again involving personnel-intensive procedures. The former sounds simple, whereas the latter seems complicated — and when you include the hitherto negative experiences which one can have with library personnel and nested library organisational procedures, everyone is immediately convinced that the new method is better — and better must be cheaper. And that, my dear Reader, is exactly how “Open Access” entices the unwary.

To understand this enticement more clearly, I’ll first explain why Yale University called a halt to the financing of articles on the “BioMed Central” “Open Access” platform — literature financed by that venerable university’s own library. I’ll then introduce you to an Austrian survey of the costs of “Open Access”. This is supplemented by two of my own model calculations which illustrate the “Open Access” costs that accrue for the institutions or the (taxpayer) societies, which the scientists and their publications finance. At the end of the chapter, I have included an intensive analysis of a

British study which has been much praised in "Open Access" circles. The study attempts to provide evidence (based on a mass of numerical data) that "Open Access" is indeed a worthwhile project for society as a whole.

1 The Case of Yale University

There have been many discussions between the opponents and the proponents of "Open Access" regarding the case of Yale University and 15 more American institutes,[1] all of which terminated their membership with the well-known BioMed Central (BMC)[2] "Open Access" platform. During these discussions, however, facts were distorted and some topics were not correctly comprehended. This is why I now include a detailed description of the Yale case.

In Germany, Yale pulling out of BMC first attracted the attention of "medinfo",[3] and the German "Open Access" information platform also documented the issue.[4] The enormous amount of publicity ensuing from the Yale termination ultimately persuaded BMC to react.[5]

The original announcement of the termination has meanwhile vanished from Yale University's homepage, but the essential passages can still be accessed via the sources in the footnotes below. These make any pertinent content easy to reconstruct.

The Cushing/Whitney Medical Library and the Kline Science Library of Yale University had become BMC members in 2005, in order to provide interested Yale scientists with

[1] See the blog "Chronicle of Higher Education".
[2] http://www.biomedcentral.com/.
[3] http://medinfo.netbib.de/archives/2007/08/06/2223.
[4] "Yale steigt bei Biomed Central aus".
[5] "Yale and open access publishing — a response from BioMed Central".

Year	BMC fees in $
2005	4 685
2006	31 625
2007	64 600

Table IV.1: Yale University's rising "Open Access" costs

reduced rates for publishing their contributions via BMC. The annual membership costs for BMC and the publishing fee levied by BMC for individual contributions was paid for by the two libraries which are part of Yale's library system. In 2005, the costs and the fee amounted to $ 4,685, $ 31,625 in 2006 and in the summer of 2007 when Yale pulled out, the amount was $ 29,635, with a further $ 34,965 for already submitted, but not yet published articles. Table IV.1 illustrates this.

In its explanation of why it pulled out of BMC, Yale made it perfectly clear that it fully supported the widest possible dissemination of scientific publications, but that BMC's financing model was simply not feasible. The original explanation stated that, quote, "We believe in the widest possible access to scholarly research supported by business models and should BioMed Central develop a viable economic model which allows them to more equitably share costs across all interested stakeholders, we would consider renewing our financial support."[6] It is clear that Yale's reasons for pulling out were purely economic. That truly astounded the "Open Access" scene and it still shocks them today — because the very idea that "Open Access" might not be the perfection they had thought it to be has no place in their ideology.

Their ideology, however, does include the theory that

[6] Quoted from http://medinfo.netbib.de/archives/2007/08/06/2223.

Type of expenditure	Expenditure in $
Monographs	12,0
Journals/Series	7,7
Electronic journals/Series	4,2

Table IV.2: Expenditure of the Yale University Library in 2006

"Open Access" must replace conventional publishing in the form of paper journals and paper books because it is allegedly cheaper.

In this unfortunate situation, some individuals tried to remove the blame for the Yale case from the "Open Access" economical system and pin it firmly on the economics of the paper publishing system. They touted the argument that Yale spent more than $ 7 million for its 70,000 subscriptions to conventional journals — and then didn't even have enough left over to spend a mere pittance on "Open Access".

The facts — as stated in Yale's pullout statement — have actually nothing in common with ad hoc explanations like this. Of course Yale, with a libraries budget of $ 75 million and a spending allocation of $ 4.2 million for electronic journals and series alone (see IV.2),[7] could easily have paid BMC's $ 64,600 which was due in 2007. However, Yale's statement made clear that the real problem was BMC's "business model", which Yale no longer wished to finance via its library budget. In order to explain Yale's problems with BMC, I would like to briefly illustrate this particular business model.

BMC's business model is the same as the majority of the commercial "Open Access" business models: the author pays the "Open Access" platform a publishing fee, which the plat-

[7] Source: http//www.arl.org/bm~doc/arlo6.csv.

form uses to cover its costs (hardware, software, personnel, other operating costs) and attempts to ensure that the article published on the platform will remain available for users all over the world for all time. All this doesn't come cheap … and since the future cannot be foretold, fees intended to anticipate future costs (without scaring away prospective authors) must be levied. In the case of BMC, these fees range from € 220 to € 1570, depending on the particular electronic journal in which the author wishes to publish his or her contribution.[8]

This means, however, that the more an institution's scientists wish to publish via "Open Access", the higher the costs that particular institution (which finances the authors and is generally a university) will have to bear — because "Open Access" does not use a scaled fee payments system. A system like this would ensure that the costs per produced article would be reduced in the case of high production numbers; and the price of the product itself would either also be reduced, or users would get more content for the same price. Instead of this, the "Open Access" operators stick by their own principle — *the more authors publish, the more expensive it will be for the institution which finances them.*

From Yale's point of view, the lack of a scaled fee payments system means this: in Yale's School of Medicine there are currently 1849 active scientists.[9] So if Yale had to finance the publishing of only one article per year and scientist with BMC, the expenditure would have amounted to € 1,985,826 (around $ 2.5 million at an average BMC publishing fee of € 1,074 per literary contribution). In a country in which the science community is voluntarily ruled by the maxim "publish or perish", it is much more probable that each of these

[8] See the FAQs at http://www.biomedcentral.com/info/about/apcfac.

[9] See http://www.yale.edu/oir/factsheet.html#Faculty.

scientists would publish 3, 4 or more articles per year, meaning that Yale would have been faced with costs of $ 10 million for financing its medical department's publications via "Open Access" — more than Yale currently pays for its paper journals and series in all subjects and departments ($ 7.7 million). And one can easily estimate that the total costs of the medical "Open Access" segment would be around $ 12 million — roughly equal to the amount that Yale spends for electronic and paper journals and series in all of its departments.

To clearly explain the effects the lack of a scaled fee payments system generate, perhaps we should turn our thoughts momentarily to the consequences (for Yale) were the university to use the "Open Access" publishing model for all of its subjects — the proponents of "Open Access" have explicitly stated that this is their model of the future. The calculation here is also simple: in this case Yale would have to finance the publications of 3,619 salaried scientists (faculty), plus those of the 1,920 researchers at Yale — meaning the publications of 5,539 persons. If each of these scientists wanted to publish only one contribution a year on an "Open Access" platform, the fees of which, like BMC's, amount to an average € 1074 per contribution, the Yale University (Library) would be faced with costs of € 5,948,886 or around $ 7.7 million.

However, it can be assumed that each of these scientists will want to publish more than one contribution per year, so the lack of a scaled fee payments system would quickly lead to financial disaster for Yale's library budget: at five contributions per year per Yale scientist — a total of 27,695 publications — Yale would be confronted with "Open Access" costs of roughly $ 39 million.

That is considerably more than the $ 34 million spent by

Yale each year to purchase roughly 255,000 books (volumes) and millions of articles in paper form.[10]

For a country in which one can perform calculations, the consequences are more than obvious — and Yale acted, pulling out of "BioMed Central". Yet another consequence is of course that "Open Access", as practised by BMC, seems to be a financially attractive model — not for those who have to pay the publishing fees, however, but for those who rake them in. So it comes as no surprise that the international media concern "Springer science+business media" purchased the "BioMed Central" platform in October of 2008.[11]

2 The Vienna Study Project

A study project was carried out in 2006 by the University Library of the Medical University of Vienna. The project was intended to ascertain whether or not "Open Access" would cost three Vienna educational establishments less than continuing with the conventional purchase of paper publications (the Medical (MUW), the Technical (TUW) and the Vet. Medical (VUW) Universities).[12]

The number of journal articles published in 2005 by authors from each of these universities was first ascertained, then how much each university had to pay for its subscription costs to scholarly journals.

They calculated how expensive it would have been for each University if their people had published contributions via "BioMed Central". The years used for the purposes of

[10] Pertinent material can be found in the statistics of the American Library Association, http://www.arl.org/bm~doc/arlstat07.pdf, p. 71.

[11] http://www.springer-sbm.de/index.php?L=I+id=13036.

[12] Bauer: "Kommerzielle Open Access Publishing-Geschäftsmodelle auf dem Prüfstand".

University	2005 JSubs.	2005 BMC	2006 JSubs.	2006 BMC
VUM	280 000	160 000	280 000	352 000
TUW	1 490 000	1 550 000	1 490 000	3 410 000
MUW	1 200 000	1 305 000	1 200 000	3 795 000

Table IV.3: Costs in Euros for journal subscriptions vs "Open Access" author fees
JSubs.: Journal subscriptions
BMC: "BioMed-Central" author fees

the analysis were 2005 and 2006 — because 2006 saw BMC increase its fees and taking 2006 into the calculation would also expose the effects of the price policy of the "Open Access" portal.

The results (summarised in Table IV.3) were a shock for all concerned. Instead of € 280,000, the VUW would have had to pay BMC € 352,000 for its author fees — € 72,000 more (26 %); in the case of the TUW, the costs would have gone from almost € 1.5 million to around € 3.4 million — that is more than double the normal costs (127 %); and for switching to BMC, the MUW would have more than tripled its costs from € 1.2 million to almost € 3.8 million (€ 2.6 million more... 217 %)[13]

In short — because "Open Access" does not have a scaled fee payments system, the three Vienna universities, like Yale, would have had a dramatic increase in their publishing costs.

3 Two Models Calculated

One could be forgiven for thinking that Yale and the Vienna study project were exceptions — but this is not the case,

[13] These costs would have risen even higher if publishing prices had been

because BMC's pricing policy was not only unacceptable for Yale — other American British and German universities and research institutions were of the same opinion. In 2005, 50 German scientific institutions had memberships with BMC — today there are only 29; in America memberships fell from 145 (2006) to 94 (2009), while in the UK BMC memberships numbered 130 in 2006, but only three years later, in 2009, that number had fallen to 24.[14]

However, since the Alliance of German Science Organisations regards "Open Access" as being a model to be pushed and promoted, and not only in the STM sector (science, technology, medicine) but also in social sciences and the humanities, it is necessary to take a closer look at the effects of "Open Access" beyond the boundaries of the STM sector. The following two model calculations do just that. The first illustrates what would happen if the "Open Access" model à la BMC was imposed upon a well-known humanities' scholarly journal. The second calculation illustrates what kind of costs the taxpayer in Germany would have to face if all the scientists from every scientific sector were to publish their future works via "Open Access".

3.1 The Average Value — € 1,806

A model calculation is usually confronted by a whole series of unknown factors. In our case, however, the number of unknowns can be reduced to just one decisive factor — how high are the actual costs for publishing a scientific article? By

on a 'per contribution' basis — as Springer charges for its "Open-Choice" model. Bauer has more on this in Bauer: "Kommerzielle Open Access Publishing-Geschäftsmodelle auf dem Prüfstand".

[14] 2006 membership numbers were taken from Schmidt: "Geschäftsmodelle des Open Access-Publizierens", p. 294. Current figures for these can be found in http://www.biomedcentral.com/inst/.

costs, I don't mean the costs for a scientist's thinking time, for heating the room where he or she works, or for paper and pencils; no, I mean the *fixed* costs which are generated during the production and publication of a journal article — irrespective of whether the article is published electronically or on paper. It is these fixed costs which are either recouped via the journal's subscription price or the book's purchase price (as in the current publishing model), or recouped by the publishing fees paid by the author (as in the case of "Open Access").

It's no wonder that these fixed costs do not share a common constant — because the degree of technical know-how put into the production of an article depends on the intensity of the cultural (or specialised cultural) context like, for example, formulas in mathematics, complicated graphics in chemistry, coloured illustrations in the humanities, licences for illustrations, personnel costs and much more of that ilk — in the face of so much variation, we cannot logically expect to find a common value here at all.

There are indications, however, of the framework to which fixed costs like this are allocated. The British "Wellcome Trust", for example, states that fixed costs range between $ 250 and $ 2000, depending on the journal in question.[15] At a hearing in the British House of Commons on the topic of scientific publishing, representatives of the *Nature* journal stated that if they switched to "Open Access", the article fees would range from £ 10,000 to £ 30,000.[16] In its final report on the hearing, the parliamentary committee defined fixed costs of £ 900 (around € 1000) per article for a high-quality journal,

[15] Welcome Trust: *Costs and business models in scientific research publishing*, pp. 11–12.

[16] Bauer: "UK Parliament's Science & Technolgy Committee Inquiry", pp. 38–39.

and £ 450 (around € 500) for an average quality journal.[17] Put in context — we must remember that the average publishing fee charged by BMC for its journals is € 1078, whereas the *Public Library of Science* (PLoS) which demands the highest standards of quality for its publications, charges an average of € 1806 for publishing fees for one article (see Table IV.4).[18] This corresponds to the amounts determined by a British study project (a project much praised in "Open Access" circles) viz. £ 1524-£ 1830 (€ 1777-€ 2133), per "Open Access" article.[19] At $ 3000 per article, Springer's "Open-Choice" model price is much higher.[20]

Name	Fee in $	in €
PLoS Biology	2850	2280
PLoS Medicine	2850	2280
PLoS Computational Biology	2200	1760
PLoS Genetics	2200	1760
PLoS Pathogens	2200	1760
PLoS ONE	1300	1040
PLoS Neglected Tropical Diseases	2200	1760
Average (rounded)	2257	1806

Table IV.4: Public Library of Science list of journals

If we assume that "Open Access", with all its publishing/technical particularities is used for all disciplines, we should not look for the fixed costs for scientific publications

[17] House of Commons. Science and Technology Committee: *Scientific Publications: Free for all?*, p. 39.
[18] http://www.plos.org/journals/pubfees.html
[19] Houghton et al.: *Economic implications*, pp. XV, 157–158.
[20] http://www.springer.com/open+choice?SGWID=0-40359-12-115393-0.

in the lower section of the costs forecasts. Since "Open Access" proponents regard the British study project as being conclusive, and the fees charged by the PLoS lie in the lower sector of the prices determined by the British study project, there can be no objections if the following cost calculations are based on the PLoS average value of € 1806 per article.

3.2 Our Example — the DVjS, a Scholarly Journal for Literary Science and the History of Ideas

A subscription to the DVjS (German Quarterly Journal of Literary Science and the History of Ideas),[21] costs a university library € 116 per year, including postage costs. The library and its users receive four issues a year for this and each journal contains approximately 6 articles.

"Open Access" — DVjS: the costs for a library

Let's assume that all 254 contributions published in the DVjS from 1999 to 2008 were submitted by one of the 80 German universities,[22] that would correspond to an average statistic of around three contributions per German university in this 10 year period.

If we now use these numbers for our calculation, we see that a German university library has to pay the sum of € 1160 for a 10-year subscription to the DVjS. If this university had financed three DVjS publications with the "Open Access" model for the same period, it would have cost € 5418, meaning € 4258 more for "Open Access". Let's include possible exceptions here and suppose that the university library in 10 years only had to finance one single contribution in the

[21] http://www.uni-konstanz.de/dvjs/.

[22] The German library statistics for 2009 names 80 university libraries. This is the number referred to.

Paper sub.	OA: 1 contrib.	OA: 3 contrib.	OA: 10 contrib.
1160 Euro	1806 Euro + 646 Euro + 156 %	5418 Euro + 4258 Euro + 467 %	18060 Euro + 16 900 Euro 1557 %

Table IV.5: »Open-Access«charges for a library
OA = Open Access
sub. = subscription
contrib. = contribution

DVjS via the "Open Access" model; it would cost that library roughly € 646 more than a 10-year subscription to DVjS would cost. The costs would really go through the roof for the unfortunate library which had to finance prolific authors — that library would find "Open Access" to be a financial bottomless pit — because the more scientists who want to publish via "Open Access", the more expensive it becomes for the library … and consequently for the taxpayer. Table IV.5 gives some examples of possible publishing numbers.

The library could therefore only profit from the "Open Access" model if it had no DVjS author amongst its scientific authors during our 10-year period — and the library would have saved € 1160 in subscription costs to the paper journal!

"Open Access" — DVjS: Publishing Costs for a State

Let us now take a look at whether or not the "Open Access" model would be cheaper for the DVjS, when we take into account the universities' publishing behaviour for an entire state. I've chosen the state of Baden Württemberg here — it has seven universities.

Between 1999 and 2008, university staff in this state pub-

lished 31 articles in the DVjS. If we assume that all seven universities have a German Studies Dept., we can further assume that all these universities have two subscriptions to the DVjS, one for the German Studies Dept. and one for the University library. So for our time period of 1999 to 2008, the seven universities in Baden Württemberg would have to pay DVjS subscription costs of € 16,240 — € 116 for an annual subscription times 10 (years) times 14 (universities/institutes).

Since 31 university associates published articles in the DVjS between 1999 and 2008 in Baden Württemberg, the state would have had to pay a total of € 55,986 in publishing fees based on the "Open Access" model.

So "Open Access" would have cost the taxpayer € 39,746 more than the conventional publishing method with the paper version of the DVjS. Table IV.6 summarises this and displays the additional costs in numerals and percentages.

Paper sub.	OA: 31 contrib.
16 240 Euro	55 986 Euro
	+ 39 746 Euro
	+ 345 %

Table IV.6: »Open-Access« costs for a state

"Open Access" — DVjS: Publishing Costs for an entire country

Let's assume for a moment that education costs are not borne by individual states, but by the country as a whole. Would "Open Access" financing for the DVjS be financially advantageous for the whole country? If we again assume that Germany has around 80 universities, each of which has two

DVjS paper subscriptions, one for the German Studies Dept. and one for the library. In this case DVjS would have cost the German taxpayer a total of € 185,600 from 1999 until 2008.

Around 254 articles have appeared in the DVjS between 1999 and 2008. 63 of these articles originated from scientists based in foreign universities and therefore were not paid by the German taxpayer via the "Open Access" model. The 191 contributions to be paid by the taxpayer would have cost € 344,946 via the "Open Access" financing of the DVjS. This amounts to € 159,346 more than the paper issue of the journal cost.

Table IV.7 summarises this and displays the additional costs in numerals and percentages.

Paper sub.	OA: 191 Paper sub.
185 600 Euro	344 946 Euro
	+ 159 346 Euro
	+ 186 %

Table IV.7: »Open-Access« costs for the whole of Germany

Conclusion The model calculation shows that switching DVjS subscriptions to the "Open Access" system would not ease the financial burden … quite the opposite in fact: in all three scenarios, the "Open Access" costs for DVjS subscriptions are considerably higher than the costs for publishing on paper and for subscriptions.

National Publishing Costs

In Germany, around 175,000 scientists work in universities (professors, assistance, scientific employees and miscellaneous teaching staff).[23] Assuming that the taxpayer has to finance one article in "Open Access" from each of these researchers per year, then the total amount in question would be around € 316 million — and if the academic publishing compulsion led to each scientist publishing three articles per year, then the sum in question for "Open Access" publishing fees alone would amount to € 948 million.

To illustrate the high financial altitudes at which these amounts fly, we can compare them to the total amount the German taxpayer paid in 2007 for all scientific libraries (personnel and building costs, expenditure for acquisition of literature, etc.) — this amounted to € 785.5 million, of which € 269 million were spent on books, journals and media.[24]

It's not difficult to see that even one "Open Access" financing of one single article per scientist is more expensive for the German taxpayer than the total amount which he pays for the acquisition of books, media and journals by scientific libraries. And if the taxpayer has to finance three "Open Access" articles per scientist, then the publishing fees would exceed the tax subsidies for all scientific libraries by a massive € 163 million.

I'll put it another way: if the taxpayer had a choice, he would have an alternative here — he could either finance 175,000 scientific journal articles à la "Open Access" (€ 316 million per year), or finance the purchase of 3.4 million volumes (books) for the scientific libraries (€ 269 million). The

[23] The exact figure for the year 2007 — the last year for which statistics exist — is 174,953 persons. Source: German Federal Statistical Office.
[24] Source: German Library Statistics 2007.

taxpayer is faced with the issue whether he wants to pay 948 million for financing three "Open Access" articles written by every German scientist — a total of 525,000 journal articles, or € 785.5 million to finance all of the scientific libraries — with (2007) totals of 580,000 journal subscriptions, 3.4 million purchased books p.a., and 2.3 million purchased licenses for digital media, plus all buildings and all personnel.[25]

The less costly alternative is there for all to see — and it would be perfectly reasonable and logical to assume that in this case cheaper is better.

Basically, the question here is whether switching to a digital publishing culture (as the representatives of "Open Access" so fervently desire) would actually save infrastructure costs — because they are a seriously important factor in the case of the libraries: in 2007 it cost the taxpayer € 516.5 million to finance the infrastructure of the scientific libraries, which then spent € 269 million on acquiring and storing literature. So perhaps the literature purchasing costs (which accrue as literature production costs) are indeed higher in the case of "Open Access", but how do the infrastructure costs compare?

Finding an answer to this question is virtually impossible — because, in contrast to the libraries, which document their work and their performance in comprehensive library statistics, there is no compatible statistics data available for "Open Access"; so the infrastructure costs of "Open Access" can only be estimated. I have, however, attempted to acquire this information from other sources — and I arrived at the amount of approximately € 474 million per year for the "Open Access" digital scientific information infrastructure.[26]

So the estimated costs for the digital information infrastructure are indeed less than the official amount shown by the

[25] See German Library statistics, under the entry "Variable Auswertung".
[26] Jochum: "Katzengold", pp. 15–19.

German library statistics — but this potential 'plus' for digital publishing immediately disappears when the infrastructure and publishing costs are added together (Table IV.8).

	Libraries	OA: 1	OA: 2	OA: 3
Infrastructure	516,5	474	474	474
Publications	269	316	632	948
Totals costs	785,5	790	1106	1422

OA: 1 = 1 "Open-Access" publication
OA: 2 = 2 "Open-Access" publications
OA: 3 = 3 "Open-Access" publications

Table IV.8: Total costs of libraries vs. "Open Access" (in millions of Euros)

It is therefore extremely doubtful whether "Open Access" is really what its supporters believe it to be — a global model for all scientific disciplines, a model which will give us more science for less money.

Dear Reader, the statistics tell a radically different story …

3.3 The UK and a miscalculation

The proponents of "Open Access" are fond of quoting a particular study, one which contradicts the examples and model calculations described in this book. In their opinion, this study provides evidence that "Open Access" costs are indeed lower than those in the current system of scientific publishing.[27] The Australian scientist John Houghton is mainly responsible for the study. He works for the British Joint Information

[27] Houghton et al.: *Economic implications.*

Systems Committee (JISC), which is responsible for the promotion of Internet technology in the Education and Science sectors.[28] In a recent podcast, Mr. Houghton was completely convinced … "The 'Open Access' argument is now won!"[29]

The study is divided into two parts: The first part determines the costs for conventional and "Open Access" publishing and compares them, while the second part devotes itself to a model calculation which extols the financial benefits which switching to "Open Access" could bring for society as a whole.

Let's take a closer look at the first part of the study.

Here Mr. Houghton and others confirm what we have already established on the previous pages, viz., that the publishing fees demanded by "Open Access" make the "Open Access" publishing system more expensive than the conventional publishing system.

The study estimates that the British taxpayer would have had to pay between £ 148 million and £ 177 million in 2007 (between € 173 million and € 207 million), if "Open Access" authors' fees had been paid for all the scientific articles published in the UK. This amount would have been offset by savings of £ 50 million thanks to improved access to the articles, so that the taxpayer would have had to pay around £ 130 million (€ 152 million) to finance the "Open Access" article fees.[30] Later on in the study, Mr. Houghton states that in the UK, the compensatory cancellation of all printed scientific journals — in the case of a complete and worldwide switch to "Open Access" — would still confront the taxpayer with additional costs to the amount of £ 35 million. These

[28] http://www.jisc.ac.uk/.

[29] "Podcast: Uncovering the social and economic benefits of open access".

[30] Houghton et al.: *Economic implications*, pp. 144–145.

additional costs, however, would amount to £ 140 million (€ 163 million), if the change to "Open Access" did not take place in all counties and shires and consequently the British cancelled only those printed journals in which British scientists had hitherto published their works (and which would be replaced by "Open Access" publications) — but not, however, all the journals in which foreign scientists write.[31] In short, the media change would not ease the financial burden one whit.

The study authors believe that "Open Access" publishing is financially feasible — because they offset direct "Open Access" costs against the savings which a switch to "Open Access" in the science system would target. These savings include lecture costs, research costs, copying costs, writing costs, costs for peer reviewing, costs for the absorption of publishing tasks and expert evaluations, etc., because all these activities would be carried out faster and more easily through changing to "Open Access". According to the study, savings of £ 140 million (€ 163 million) could be made in the university sector (assuming that a switch to "Open Access" could reduce these costs by 5 %).[32] Further savings could be made in the libraries, for example, through the reduction in business procedure costs for electronic documents in comparison to

[31] Houghton et al.: *Economic implications*, p. 180. Consequently, that there exists a systemic compulsion to promote "Open Access" as a national and global publishing model — because otherwise, industries which had hitherto participated indirectly in the financing of science through their subscriptions to scholarly journals would profit on a national level, benefiting from the fact that (thanks to "Open Access") they would be relieved of this indirect research financing, but would still have free access to the research publications. And on a global level, the countries which had prolific scientific authors would have to pay, while countries which were unproductive in the scientific publishing field could acquire the science of the other countries at minimal costs — or even at no cost whatsoever.

[32] Ibid., pp. 143, 152.

printed journals and books (the study estimates the amount of potential savings here to be £ 8.8 million or € 10 million). Savings could also be made by transferring electronic journals — which cost money — to "Open Access" journals, which cost no money (amount of potential savings, £ 41 million or € 48 million).[33]

Thanks to these and other possible savings generated by a switch to "Open Access", the "Open Access" publishing system would ultimately present itself as a financially attractive alternative to conventional publishing. It is, however, surprising that the study studiously avoids a numerical summation of the many savings described. The reason for this may be that the authors did not wish to expose any weakness in their reasoning, because as far as the methods used are concerned, the British study is no different from all the other studies on "Open Access" costs (including this one) — it simply estimates numbers. The real question behind the forecasts is of course just how high the real costs per "Open Access" article are, because these costs accrue as publishing fees or hidden subsidised costs in the world of "Open Access" … and here the long-suffering taxpayer must once again step forward with his wallet at the ready.

The study presumes that "Open Access" publishing fees for journal articles amounted to £ 140 million for 2007 — but as anyone reading the study can easily see, this is an estimate which is non-founded, since it is incommensurate with the media-neutral fixed costs determined by the study authors for an article and the authoring activities of the British scientists.[34] This is more than remarkable in a study which evinces a veritable multitude of detailed calculations.

[33] Houghton et al.: *Economic implications*, pp. 187 sq.

[34] Short and concise quote ibid., p. 144: "We estimate that the total costs would have been around £ 148 million." One of the many examples of

These curiosities also include the fact that the study's calculations are based solely on 2007's figures: this is like taking a static snapshot of the costs involved in "Open Access", while fading out the actual dynamic cost trends of the platform. The study thus avoids tackling the main issue, the lack of a scaled fee payments system, which in itself ensures that the greater the number of scientists who wish to (or must) publish their contributions on "Open Access", the greater will be the linear increase in publishing costs à la "Open Access". A financially feasible image of "Open Access" costs can only be presented if you 'fade out' this cost effect — and the study does just that.

Thanks to the data prepared by the study, we can calculate the costs for the British taxpayer caused by the lack of a scaled fee payments system. We learn from the study that British scientific libraries cost the taxpayer £ 600 million (€ 705 million) per year,[35] and that Great Britain had a total of 185,000 active researchers in 2007, 82,000 of whom were involved in the higher education sector.[36]

Since the study authors also estimate the costs of an "Open Access" publication to be roughly the same as in this study,[37] the data we need to carry out our small calculation (Table IV.9) is already prepared. I have only corrected the digital infrastructure costs, since the authors only take the operating costs of the servers into account. They estimate these oper-

inaccuracy in the text is that the following statement (and not the above) can be found in the introduction (Page XIII): "Open Access publishing all UK higher education journal article output in 2007 would have cost around £ 150 million."

[35] Houghton et al.: *Economic implications*, p. XIII. [36] Ibid., p. 139.

[37] Ibid., pp. XV, 157 sq. — here the authors assume that the media-independent fixed costs for one article is between € 1777 and € 2133. We had estimated these fixed costs to be € 1806 and we shall use this amount for the following calculation.

ating costs to be a maximum of £ 21 million (€ 24 million), based on the assumption that every British university has an open access server — I have logically corrected this figure to € 100 million.[38]

As table IV.9 shows, it is considerably more expensive for the taxpayer to finance only two "Open Access" publications from the 185,000 British scientists than to finance the British scientific libraries themselves: the taxpayers would have to pay € 760 million for 370,000 "Open Access" articles, € 63 million more than the € 705 million they now pay in library subsidies.

[38] The authors of the study assume that the operation of the 118 existing British "Open Access" servers, including hard and software renewal costs roughly £ 10 million (€ 11.7 million) per year (Houghton et al.: *Economic implications*, p. 176). This is a rather bland assumption, one that completely suppresses the fact that the costs for the maintenance of the data network must be added to the operating costs of the server— not forgetting the costs involved in the long-term archiving of the data. These costs are distributed over the costs for the physical maintenance/retention of the data formats' legibility and the data itself. It would be nice to know how much data is involved here — and how expensive its archiving would be, given the current state of technology today. Pertinent literature (see the overview at http://www.lockss.org/lockss/Publications) tells us that the solution for the digital archiving problem probably lies in copying the data as often as possible, whereby it is estimated that a backup copy of one petabyte of data would cost around $ 1.5 million (€ 1 million) (Rosenthal: "Bit preservation"). One can at least expect an economic study on the costs of "Open Access" to present a plausible calculation of the potential archiving costs and to take network costs into account. The fact that these two issues have been neglected is a grave shortcoming.
You will have noticed, dear Reader, that at this point I'm not using my own estimation of the digital infrastructure costs for the Federal Republic — € 474 million (see above, p. 37) — but that I am drastically reducing the value for Great Britain. This is simply a slightly playful concession to readers who are enthusiastic about "Open Access" and who greatly prefer to read about minimum possible infrastructure costs — *but* the additive

	Libraries	OA: 1	OA: 2	OA: 3
Infrastructure	464	100	100	100
Publications	241	334	668	1002
Total costs	705	434	768	1102

OA: 1 = 1 "Open-Access" publication
OA: 2 = 2 "Open-Access" publications
OA: 3 = 3 "Open-Access" publications

Table IV.9: "Open Access" in the UK (in millions of Euros)

In a nutshell: when the lack of a scaled fee payments system is also taken into account in the calculation of "Open Access" costs in the UK, the cost benefits of "Open Access" calculated by Mr. Houghton and his co-authors melt like snow under a hot Australian sun — and the UK scientific community will also discern that the greater the number of British scientists who publish their contributions on "Open Access" (and who need financing to do so) then the greater the linear increase in publishing costs.[39]

effect of infrastructure costs and the lack of scaled fee payments system cannot simply be ignored, as Table IV.9 shows.

[39] The authors of the study are indeed conscious of the problematic nature of this issue, although they make every effort to bypass it. This is expressed as early as the introduction in a curious passage in which they state the following: "Open Access publishing may require author payments, and researchers in fields that are relatively poorly funded, those working without specific project funding, and independent scholars may find it difficult to pay, unless there are specific funds made available to support publishing fees. Self-archiving also takes some additional time, but the benefits from enhanced accessibility, broader readership and, potentially, increased citations are likely to make the effort worthwhile." (See Houghton et al.: *Economic implications*, pp. XXIII sq.). Here they are trying to say that "Open Access" generates costs which are passed

Now let us tackle the second part of the study.

Here a model calculation is used to form the basis of the assumption that a switch to "Open Access" would introduce improved access to scientific information and consequently a higher level of efficiency throughout the science system. The authors assert that one à la "Open Access" published article would have a 25 % higher citation probability,[40] that easier access to electronic information would mean a 5 % increase in research efficiency,[41] and that the social yield from "Open Access" publications would be at least 20 %[42] — and from all of this, they ultimately derive that a switch to "Open Access" would amount to an indirect yield of £ 124 million per year[43] for the British scientific landscape, and system costs amounting to £ 215 million per year could be saved in the publication of scientific journals, from which £ 165 million (€ 194 million) would accrue directly to the scientific sector.[44]

These statements are all rather bold when we consider that they are based on a hotly-disputed economic model. Just how bold they are can be seen in the empirical studies which actually contradict themselves when the question arises asking whether an increase in citations (and consequently an improved level of visibility for research) is thanks to "Open Access". In answer to this question, they actually quote studies which indicate a decline in the number of citations.[45] Even without reading empirical studies, one still tends to take the statement that "Open Access" generates an increase of 5 % in research efficiency with a pinch of salt, because a study which puts empiricism under such a fine microscope should

on to authors in the form of publishing fees, which in turn can only be paid by means of tax funds — so the taxpayer actually pays up front for something he may then use 'at no cost'.

[40] Houghton et al.: *Economic implications*, p. 202. [41] Ibid., p. 204.
[42] Ibid., p. 207. [43] Ibid., p. 208. [44] Ibid., p. XVIII.
[45] See Evans / Reimer: "Open Access and global participation in science".

also be able to freely admit how high the distraction factor is — because a distraction factor inevitably comes into the "Open Access" equation when the necessary database and Internet research takes place.

That all this, however, was calculated[46] by Houghton and co. on the basis of the economic model by Solow (also taking into account the bibliometric analyses by Alma Swan) — a model which implies a mono-causal relationship between technical progress and economic growth — finally reveals where the true worth of this study really lies: it is pure contract research in an environment (in both the UK and Germany) which has long become accustomed to regarding science as being just another sphere of activity for economic policy.

So we should not really be surprised if science is operationalised on the basis of economic criteria in this environment, and, as a result, only accessibility and efficiency are of interest, because they are used as criteria to discover how science can be made faster, better, wider, and greater[47] in order to be able to offer the taxpayers (as investors) a decent "return of investment". The question of truth has herewith been successfully replaced by the question of measurable and economically exploitable 'output'.[48]

[46] See Houghton et al.: *Economic implications*, pp. 197 sqq. and Houghton / Sheehan: *The economic impact of enhanced access to research findings*.

[47] See the list of impact factors in ibid., p. 5.

[48] A pertinent issue in the political context of the study by Houghton and co. is the fact that in 2004 a committee of the British House of Commons did pass recommendations in favour of "Open Access", but these recommendations were not adopted by the government. See again the summary of the committee hearing in Bauer: "UK Parliament's Science & Technolgy Committee Inquiry". The official response of the British government to the recommendations of the Commons committee can be found at House of Commons: Committee on Science and Technology,

Let us conclude our analysis by referring to the start of this chapter: Mr. Houghton works for the JISC, which is certainly not a neutral observer of development — it is a massive protagonist firmly entrenched on the side of "Open Access".

3.4 The Results

Let us not lose sight of this — the great economic problem "Open Access" has is *the absolute lack of a scaled fee payments system — this effectively means that the greater the number of authors who wish to publish their contributions on "Open Access" (and who receive financing to do so), the greater the linear increase in publishing costs.*

This problem exists in all conditions and would continue to exist if the government were to be given control of publishing on "Open Access" — because from a certain number of publications, the fixed costs estimated per published article would always ensure that the "Open Access" system remained more expensive than the existing publishing system.

The attraction of "Open Access" can be easily explained. In the case of the scientific libraries, they use scientific books and journals, define the accrued costs as purchasing and subscription costs and register these in comprehensive statistics, enabling public debates to be held on these costs. The costs for "Open Access", on the other hand, accrue to the production side and are *not statistically registered* — or within the system of third-party funded research, they are even booked as income on the level of all the individual institutions which receive such third-party funds as project finances.

Fourteenth Report, Appendix 1. A collection of statements by "Open Access" supporters in response to the British government can also be found at http://www.biomedcentral.com/openaccess/inquiry/.

This all ensures that when "Open Access" offers are used, the illusion of the "cost-free" is doggedly created.

"Open Access" thus reveals itself as a system in which all those who themselves produce nothing can still feel like profiteers getting something for nothing … but this is only a feeling, because behind the backs of those alleged profiteers, the government pulls in the taxes through which the illusion of "free" is kept alive.

V "Open Access" Capped

No one could seriously believe that the "Open Access" costs which increase linearly in direct relation to the number of scientists who wish to (or have to) publish their works on this platform would ever be taken over by the public sector. Here, as well as in other sectors, there has to come a point at which funds are shut off and expenditure capped. And as soon as this point has been reached, "Open Access" would have to fit into the usual system of shortage management, where principally infinite needs (whether these exists objectively or only subjectively) meet principally finite tax revenues — and then the criteria must be selected that will decide whether or not the finite means will be spent.

But (they will loudly cry) "Open Access" is no different in this respect than the current publishing and library system, which has long been familiar with shortage management. The loud ones, however, overlook the fact that the costs for "Open Access" accrue to the author at the beginning of the publishing chain and not to the customer at the chain's end — and they also seem to find it difficult to comprehend that it is this (at first glance insignificant) shifting of the paying point that will create grave scientific/university/political and ultimately social disruptions.

To understand this better, let us first take a good look at the current publishing and library system. Here the scientific authors come into contact with a limited number of scholarly journals and publishing houses, which serve as distribution channels for the publications — and at the end of the channels are the catchment pools of the libraries, which, with their

limited budgets, purchase the material which they believe is optimal for their purposes.

In this system, the publications are filtered on two levels (level 1: publisher/journals, level 2: libraries) and the quality of the publications is examined with each filtering process. Only the best, however, are passed into the publishing channel or the catchment pool, due to the limited financial means. This "best" is evidently not what most of the scientific authors believe is best, but what the sales people (the publishers) and the end customers (the libraries) believe to be worthwhile, based on their criteria.

Now imagine a complete publishing system change to "Open Access" — the two filter levels would be missing in this system. They would be replaced by an author-oriented self-management system of publishing in which the professional position of the 'sender' would be all-important — because the position of the receiver has now been taken up by the technical apparatus of the network, which in itself practices no quality control and has no filter function — all it does is store what it is given to store.

Taking the limitations of available funds into consideration, this would now mean that "Open Access", as a tax financed and (consequently) state-controlled publishing system, would soon have to start thinking about bureaucratic mechanisms, in order to balance out the number of publications to be distributed via "Open Access" against the amount of available funds. From a bureaucratic point of view, these mechanisms have to exist, because "Open Access" has meanwhile made the publishers and libraries superfluous, they would only be a faint historical memory — and now the scientists in the system would themselves have to start deciding which publications should be passed for funding or rejected. This science system, however, is nothing other than a bureaucratic

system of the universities self-management and committee control — and in past years the democratic elements have been eliminated from this system, in order to implement more hierarchical elements.

In this hierarchically-structured system, self-management of the incoming publications must be integrated into the system — and this would mean that committees must be set up on site in the universities. These committees would decide which of the publications to publish on "Open Access". In a science system in which the evaluation of publications can make or break careers, a committee like this would soon be the most powerful committee in the university — and the committee members would be the top dogs on campus. In short, the publishing committee would be right up there at the top of the hierarchy, dominating all university activities.

The consequences of this for the science system would be devastating.

Firstly, the question must be asked whether or not the establishment of such committees infringes upon the constitutionally guaranteed freedom of the sciences — would it really be ethical for professors (or librarians mutated into university publishing agents) to decide which professor is to receive financial help from the "Open Access" pot and which professor is to get nothing? In this scenario would we not have to reckon with one or two professors taking their universities to court over the allocation of "Open Access" publishing funds? And what would happen if one of these professors won his case, but there was no more in the pot to finance the publication which was originally denied funding? Under the conditions of "Open Access", would there even be scientific publishers to whom he could turn for help? And may our scientific author even turn to a Winkler Publishing House which may just have survived, if the University has

stipulated that "Open Access" must be used as a publishing platform for its members?

Secondly, it must be assumed that such a system of scientific publishing would tend towards monomania and no one could possibly want that. The system would be monomaniac because— thanks to the elimination of scientific, external filter mechanisms — it would only be capable of orbiting within and around itself, without sparing a thought for potential readers outside the campus, without the possibility to correct (using the experience gained in something other than science) that which science is. It may be that scientific revolutions would still take place thanks to new discoveries. But what would happen if the top dogs of the publishing committee made sure that the discoverer of the new did not get the chance to communicate his or her new discovery to the scientific world (or at least to this encapsulated world) by denying financial means for the "Open Access" publishing of their new discovery? Would we not have to expect that the publishing committees of this system would create and nourish monomaniac science cardinals, who would then lord it over the "Open Access" funds, treating them as a sinecure?

Thirdly, we must ask ourselves towards what objective would a system like this tend to gravitate — a system from which all cost reducing economies have been expelled, only to be replaced by a pure bureaucracy. Now, publishers are introducing their private economies into the science publishing game, and libraries are acting as transmission belts for scarce tax funds, reducing the archiving of scientific publications any way they can — but the future would not tolerate any more talk of limiting distribution to profitable markets and limiting the acceptance of that which is distributed to the most important items for the library. Instead, the focus would be on safeguarding or increasing the "Open Access" publish-

ing funds by means of tax transfers, but not in association with the economy (publishers) and the storage facilities (libraries) — no indeed — contact would only be maintained with politics to retain control over the publishing system. This only means that the publishing bureaucracy of the universities will become a political publishing bureaucracy, fulfilling the expectations of its political environment by authorising publication of this or that literary effort on "Open Access". And it must fulfil these expectations, since it is ultimately politics which distributes the tax funding.

"Open Access" would thus be instrumental in bringing about the end of the process of enlightenment, a process which has been constant in civilised human society for roughly three hundred years. This process was mainly based on what Kant described as being the 'public exercise of reasoning'. Kant argued that science should be more than just a methodically safeguarded process through which results could be achieved; it meant that science should not hesitate to 'go public' and join the open forum of reasoning, where it should say what it had to say. This assumes that there exists not only a public for science, but that science also has a medium in which frankness, reasoning and the public can work together. For Kant it was clear that this medial convergence point of enlightenment was the "reader's world",[1] — the world of paper journals and paper books to be found in public rooms like reading rooms and libraries — and these public rooms constituted public rooms because the public could rationalise there about books and journal articles together. The public would thus form a "world"[2] in which the two meanings of the word 'bilden' (to educate and to mould) could thrive and stand the test of time. In coming together

[1] Kant: "Beantwortung der Frage: Was ist Aufklärung?", p. 55.
[2] Ibid., p. 57.

with others to rationalise, one actually moulded and educated himself, and in this self-moulding created a world which could discard everything that was machine-like, in order to assert the dignity of man — his freedom.

What is being done in the name of "Open Access" is a clear assault on this dignity.

VI Bibliography

Bauer, Bruno: "Kommerzielle Open Access Publishing-Geschäftsmodelle auf dem Prüfstand. Ökonomische Zwischenbilanz der »Gold Road to Open Access« an drei österreichischen Universitäten". In: *GMS Med Bibl Inf* 6 (2006). URL: http://eprints.rclis.org/8804/2/mbi000050.pdf.

— "UK Parliament's Science & Technolgy Committee Inquiry". In: *medizin – bibliothek – information* 4 (2004), pp. 38–43. URL: http://www.agmb.de/mbi/2004_2/bauer38-43.pdf.

DFG / Unterausschuß für elektronisches Publizieren, Ausschuß für wissenschaftliche Bibliotheken und Informationssysteme: "Elektronisches Publizieren im wissenschaftlichen Alltag. Überlegungen zur Integration elektronischer Publikationsformen in die Geisteswissenschaften". In: *Bibliotheksdienst* 40.8/9 (2006), pp. 988–993. URL: http://www.dfg.de/download/pdf/foerderung/programme/lis/elektr_publizieren.pdf.

Evans, James A. / Reimer, Jacob: "Open Access and global participation in science". In: *Science* 323 (2009), p. 1025.

Houghton, John / Sheehan, Peter: *The economic impact of enhanced access to research findings*. Vol. 23. CSES Working Paper. Melbourne: Centre for Strategic Economic Studies, 2006. URL: http://www.cfses.com/documents/wp23.pdf.

Houghton, John et al.: *Economic implications of alternative scholarly publication models. Exploring the costs and*

benefits. A report to the Joint Information Systems Committee (JISC). o. O.: Victoria University; Loughborough University, 2009. URL: http://www.jisc.ac.uk/media/documents/publications/rpteconomicoapublishing.pdf.

House of Commons. Science and Technology Committee: *Scientific Publications: Free for all? Tenth Report of Session 2003–2004*. London: The Stationary Office, 2004. URL: http://www.publications.parliament.uk/pa/cm200304/cmselect/cmsctech/399/399.pdf.

Jochum, Uwe: "Im Namen der Freiheit". In: *Frankfurter Rundschau, 7.4.2009*. URL: http://www.fr-online.de/in_und_ausland/kultur_und_medien/feuilleton/1712640_Allianz-der-Wissenschaftsorganisationen-Im-Namen-der-Freiheit.html%22.

— "Katzengold. Eine Kritik der Nationallizenzen". In: *Text* 12 (2008), pp. 13–29. URL: http://www.textkritik.de/digitalia/katzengold.pdf.

Kant, Immanuel: "Beantwortung der Frage: Was ist Aufklärung?" In: *Werkausgabe*. Ed. by Wilhelm Weischedel. Vol. 9. Frankfurt am Main: Suhrkamp, 1982, pp. 53–61.

— *Kritik der reinen Vernunft*. Ed. by Raymund Schmidt. Hamburg: Meiner, 1993.

Kaufman-Wills Group: *The facts about Open Access. A study of the financial and non-financial effects of alternative business models on scholarly journals*. Clapham: Association of Learned and Professional Society Publishers, 2005. URL: http://www.alpsp.org/ngen_public/article.asp?id=200&did=47&aid=270&st=&oaid=-1.

Kuhlen, Rainer: *Erfolgreiches Scheitern. Eine Götterdämmerung des Urheberrechts?* Boizenburg: Hülsbusch, 2008. URL: http://kops.ub.uni-konstanz.de/volltexte/2008/5970/pdf/HI48_Kuhlen_Urheberrecht.pdf.

Reuß, Roland: "Eingecremtes Publizieren. Open Access als Enteignung". In: *Frankfurter Allgemeine Zeitung, 11.2.2009*, pp. N5. URL: http://www.faz.net/s/RubC3FFBF288EDC421F93E22EFA74003C4D / Doc~E8A8C72C667984805A1F2CF2954CD7C78~ATpl~Ecommon~Scontent . html.

Rieble, Volker: "Forscher sind nicht normale Angestellte". In: *Frankfurter Allgemeine Zeitung, 29.4.2009*, pp. N5. URL: http://www.faz.net/s/RubC3FFBF288EDC421F93E22EFA74003C4D/Doc~E1E966871663A4D38B893FC298276C794~ATpl~Ecommon~Scontent.html.

Roesner, Elke: *Open Access Portale und ihre Etablierung am Markt. Die Entwicklung des Geschäftsmodells für »German Medical Science«*. Berliner Handreichungen zur Bibliotheks- und Informationswissenschaft 230. Berlin: Institut für Bibliothekswissenschaft, o. J. URL: http://www.ib.hu-berlin.de/~kumlau/handreichungen/h230/h230.pdf.

Rosenthal, David S. H.: "Bit preservation. A solved problem?" In: *Proceedings of iPRES2008*. London, 2008. URL: http://www.bl.uk/ipres2008/presentations_day2/43_Rosenthal.pdf.

Schmidt, Birgit: "Geschäftsmodelle des Open Access-Publizierens. Welche Perspektiven bieten sich für Bibliotheken?" In: *Bibliothek* 30 (2006), pp. 290–297. URL: http://www.bibliothek-saur.de/2006_3/290-297.pdf.

Welcome Trust: *Costs and business models in scientific research publishing*. Histon: SQW, 2004. URL: http://www.wellcome.ac.uk/stellent/groups/corporatesite/@policy_communications/documents/web_document/wtd003184.pdf.