CHAPTER NINE

Electronic Publishing, Open Access, Open Science and Other Dreams

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It may seem a bit egomaniacal when I describe how I envision not only scholarly publishing in the future, but also outline further considerations on open access and open science, which go beyond the actual intention of this anthology (Taubert & Weingart 2016). In this article, one should expect extensive data analyses of the publication behaviour in the sciences (which in this article also include the humanities and social sciences) and prognoses derived from them. However, this has already been done in a detailed manner in other contributions to this volume. I therefore take the liberty to state my opinion, which is based on many years of dealing with this issue, subjectively. I will point out basic characteristics and make general considerations, but I will not focus on the precise roles of the players in this field, the concrete design of the involved information technology, or details concerning the legal framework.

Previous history: For 25 years, I have dealt with questions on academic publishing, the documentation of research and the representation of knowledge. I have done so not because of scientific interest, but because around 1990, several other scientists and myself, in particular scientists who dealt with information technology (IT) issues, became aware that there was about to be a period of change within publishing in general. Obviously, the development of this area was not to be left to the traditional actors – as failed policies/developments were already apparent then. Costs for journals and books exploded, and at the same time, IT made it possible to shift ever more editorial work to the authors and editors. Moreover, the visible opportunities of the rapidly developing information technologies for the improvement of supply of literature and knowledge representation were only hesitantly taken

up by the 'players of the game' (for example, publishing companies, libraries, database providers). This made it necessary for scientists to speak out.

Thus, among other things, I headed a special information project of the German Mathematician's Association (DMV), supported by the Federal Ministry of Education and Research (BMBF) from 1992 on, and was co-founder and first chair of the IuK-Initiative of German scientific societies. This initiative started with mathematics and physics, then chemistry, computer sciences, electronic engineering, biology, psychology, pedagogy and social sciences joined. The successes were, however, infrequent because the inertia of the system was stronger than expected. During that time, I predicted the demise of many small and medium-sized academic publishing companies and the concentration of the market into a few publishing houses. Through funding measures, the BMBF tried to 'make the small publishers electronically fit'. This delayed the change but was useless in the end. In many disciplines, the concentration into few highly profitable publishing companies became reality. The process, however, has taken twice as long as I had thought at the time. The shift of publishing in general to libraries, universities and scientific societies, contrary to our hopes, did not take place.

My dream: The TELOTA Initiative (TELOTA is an acronym for The Electronic Life Of The Academy) of the Berlin-Brandenburg Academy of Sciences and Humanities (BBAW), which I initiated and led for ten years, began its work in 2001. Its goal was the development of tools with which research results of the Academy (primarily from the humanities) could be digitally documented and presented. At the time, there was still a lot of scepticism within the Academy. Back then, I presented my perspective on further developments in the article 'My digital dream'. The article begins as follows:

> 'You deal intensively with electronic information and communication', said one of the editorial staffers of the journal *Gegenworte*. 'Couldn't you provide us with your dream vision of the digital information world?' – 'That's very simple', I said. 'I want everything, immediately, anytime, anywhere available for free.' 'Isn't that a bit over the top?' – 'Maybe', I replied, 'but you asked me about my dream!' (Grötschel 2001: 10).

Through my own activities in publication, communication and information, I am actively involved in the realisation of my dream. For example, more than 20 years ago I began to make all of my scientific articles and books freely accessible via my website[1] and other servers.

1 See http://www.zib.de/groetschel/publications/publications.html.

I rediscovered the text of the speech I gave at the workshop on the strategic design of the TELOTA Initiative in the year 2000 and notice today that the present article repeats many of the claims I made back then. Some of it was utopia; some of it has by now been implemented by BBAW in general or specifically through particular BBAW projects. There is, however, still enough left to do for the future.

Fifteen years since the publication of 'My digital dream' is a long time, and the dream has not yet become a reality. It should be noted though, I called my brief statement 'dream' and not 'prognosis', and I intentionally did not mention a time frame. I knew, of course, that the dream would never come true in this radical form, and meanwhile I have also learned that, even for realising parts of it, many high obstacles have to be overcome.

Is it worth holding onto it? I continue to have this dream, and I will not abandon it because I am strongly convinced that this is the right goal of the scholarly publication system, and that everybody who intensively thinks about the function of science has to come to this conclusion as well. My dream has meanwhile extended significantly. The publication system in general has to offer more and has to be developed into a system of comprehensive documentation of research and knowledge. Open science is the true goal – more on this later.

Publicly funded science: Please note here, my remarks concern publicly funded science. I am far from suggesting behaviour or marketing guidelines to authors, journalists, musicians, filmmakers, and others who live off the publication of their works. Persons and institutions that finance research from their own resources and in their own interest can, of course, use their results in any way they want to. But government-funded research and research that is funded by non-governmental third parties and which is aimed at gaining general scientific insight should – in my opinion – be published in a way that I describe in this article.

Objectives of research and science: I cannot give an overview of the historical development of science and research here. Today, in almost every country, research (mostly connected to university teaching) is mainly financed by the state. The expectations and positions are diverse. Some scientists believe that the freedom of research enshrined in the Constitution (in Germany called *Grundgesetz*) gives them the right to do what they please. Others, in turn, feel obligated to put their area of expertise explicitly into the service of industry, economy or society. Some taxpayers are happy about basic new insights 'about the world' (such as the recent direct proof of the existence of gravitational waves), while the majority, on the other hand, expects the development of something useful and thus that all of our lives are in some way improved. There is no doubt that we scientists have always 'delivered' and contributed to the improvement of the quality of life, even if one considers that research

results could also have and have had negative effects. Science always operates in a field of tension: academic freedom and ethical responsibility have to be balanced honestly. This also implies that the public needs to be informed about research results and their consequences.

Briefly put, this means: science serves to increase and improve information!

Eventually the goal is, of course, the creation of 'knowledge' in the sense of valid information. To elaborate this in detail would go beyond the scope of this chapter, though. If and how new or improved information can be employed or applied can be analysed scientifically; decisions about the use, however, are made in complicated political, social and economic processes.

Efficiency: An important goal (at least for me, since my scientific field of expertise is mathematical optimisation) is the improvement of the efficiency of research. I do not want to analyse questions that have already been solved. Rather, I want to have quick and cross-disciplinary access to existing and quality-assured literature and data that are relevant for my projects. I want to work temporally independent from the restrictions of others (for example, opening hours of libraries and archives). And I want to analyse material that seems relevant with IT tools in order to be able to decide quickly whether it is pertinent to my topic.

Basic convictions: At this stage, publishing in general comes into play. Do I keep new information a secret, do I delay its publication, in what form do I publish it, will I provide it to only a small, specialised or nationally limited circle of people, do I ask for money for my publication, do I claim property rights or will I make it freely accessible? Here the views diverge. Many factors emerge simultaneously in complex ways and they mutually interact. These range from a political position on altruism, fear of being cheated, vanity of persons and institutions, reputation and career advancement to profit maximisation. Everything that plays a role in 'normal life' does so here as well.

My basic position is very simple: as a scientist, I myself am paid by public funds and thus consider the results of my research a public good that needs to be made freely accessible to the public without any restrictions. For the first time in the history of humankind, this is now possible and I therefore advocate that it should be done.

There is a second reason. Like all scientists, I, too, would like my research results to be taken notice of by as many colleagues as possible. Contemporary information technologies extend reachability in ways that used to be inconceivable. Free access via the Internet enables quick access to literature and data for students and scientists throughout the world. Interested laypeople can inform themselves without obstacles (for example, difficult to obtain access to libraries or prohibitive sale prices), and scientists in economically disadvantaged countries are able to participate in the development. For me,

it is hard to imagine that this is not enticing and that it does not dominate every discussion against this development. The open access (OA) movement has emphatically formulated these core issues in different declarations[2] that have been signed by a large number of scientifically renowned institutions. All colleagues in my own scientific environment support this idea.

Search: Every active scientist is well versed in their own discipline. But even in related areas it has, in the current publication system, so far been difficult to inform oneself and to access relevant literature. I have experienced this in many practical projects in different fields of application of mathematics (for example, in the engineering sciences and economics). Due to my recent appointment to the presidency of the BBAW, my field of action has significantly broadened and I now have to become informed about many areas of research with which I previously had nothing to do. Personally, I now profit enormously from all that is immediately available via the Internet, anytime, anywhere and free of charge. However, the material could be organised in a *better and more user-friendly* way.

Open access: Declarations on open access have existed for more than 15 years, but many of the institutions that have signed them still have difficulties with their implementation. The situation is changing now. The European Union is a forerunner,[3] and some German federal states (currently Baden-Württemberg, Berlin[4] and Schleswig-Holstein) have passed OA strategies and demand their implementation in concrete measures by their scientific institutions. This leads to discussions and planning activities, and ever more third-party funders demand the OA publication of results of research projects they funded. Whether green or gold is the right way or whether other OA forms of publication should be chosen, is discussed in detail in other parts of this volume.

Open data, open source and open science: Making data (open data) and algorithms (open source) publicly and freely available also increasingly becomes a focus of attention – not least due to the fact that the verifiability of published results is of increasing relevance. One simply no longer trusts each diagram in a publication and seeks security by testing it on one's own. Recently, for example, media reported that most results from 100 psychological studies that were published in well-reputed journals could not be replicated. Such findings, too, slowly open the way to what is called 'open science'. A working definition of this concept is as follows:

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2 See for example, http://openaccess.mpg.de/Berliner-Erklaerung.

3 See http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf.

4 See http://www.parlament-berlin.de/ados/17/IIIPlen/vorgang/d17-2512.pdf.

> *Open science* is about disclosing all components of the scientific process and to present it in a transparent way through the Internet. More precisely: In open science, the entire process of scientific insight from the survey of data, the use of software, the kind of algorithmic processing and discovery, up to the interpretation should be documented comprehensively and made publicly available.

For me, open science is the actual goal! If one wants to make consistent use of the opportunities that digitisation provides, then science must be presented that way in the (hopefully not too distant) future.

There will not be a brief, precise and operable definition of this concept for all areas of research since the working methodologies and approaches in the different fields are too different from each other. In the open disclosure of the knowledge acquisition process and the associated information, for each discipline, different challenges and discipline-specific issues need to be taken into account. These include, among others:

- securing reproducibility and reusability;
- making publications, data sources, algorithms, software tools and interfaces technologically and legally available via the establishment of open discipline-specific information infrastructures;
- networking;
- financing of disclosure; and
- sustainable availability – taking data protection into account.

Compared to my digital dream, this open science dream is much more unrealistic, but to anyone engaged in the service of science, it is clear that it is worth taking every possible step with the goal of partially realising this dream.

Many initiatives demonstrate that open science is not just a lunatic idea. In the framework of the Open Knowledge Foundation Germany, a German-speaking open science working group was formed in Berlin in 2014, which presents the goals of open science in a mission statement. This is also done by the 'Digital Information' initiative of the Alliance of German Research Organisations in several position papers that appear under the objective[5] of 'providing researchers with the best possible information infrastructure that they need for their research'.

In 2014, the Joint Science Conference (GWK) established the Council for Information Infrastructure (RfII), which in its first recommendations[6] deals with

5 See http://www.allianzinitiative.de/start.html.

6 See http://www.rfii.de/de/index/.

the structures, processes and the funding of the management of research data in Germany. The RfII commits itself in principle to the open science paradigm. The Global Young Academy presents information material and reports on open science on one of its websites.[7] The European Commission is committed to open science, and presents its vision on a website.[8] A working group implemented by the International Council for Science (ICSU), the InterAcademy Partnership (IAP), the International Social Science Council (ISSC), and The World Academy of Sciences (TWAS) has recently produced a document[9] that deals with this issue. Explanations of diverse aspects of open science, open source, open knowledge and similar keywords can be found in Herb (2012). The Open Research Glossary[10] is an extensive collection of terms and concepts and their explanation that are common in connection with this field.

Effects of open science: A description of all consequences of open science would go beyond the scope of this article. For the purpose of orientation, I will merely mention some important keywords.

Open science will produce massive data volumes (*big data*) like ubiquitous communication activities and production processes do. Big data can no longer be handled manually, but need to be processed, understood and used algorithmically. Data should not lie around unutilised but should be seen as raw or reusable material for innovation. Big data is not the end of theory but the beginning of new possibilities of insight. I mention only *gene sequencing* and *combinatorial chemistry*. And there are many unexplored domains to be investigated still.

One extremely important topic will therefore be *machine learning*, which is based on the tools of computer science and mathematics, but which – without special knowledge about the investigated datasets – will only provide insights with little significance. An important goal here is to derive causality from statistically observed correlation and to explain it theoretically. In addition, questions of technological and legal security, protection against forgery, data protection in general, etc. need to be taken into account. Here, significant scientific challenges lie before us.

Progress in this area has direct consequences on developments in the economy. This has been summarised under the keyword *Industry 4.0*, and will supposedly lead to entirely new supply chains and production processes. The same is true for *e-government*, an area in which Germany has a lot of catching up to do.

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7 See http://globalyoungacademy.net/activities/open-science/.

8 See http://ec.europa.eu/research/openscience/index.cfm.

9 See http://www.icsu.org/science-international/accord/open-data-in-a-big-data-world-short.

10 See https://figshare.com/articles/Open_Research_Glossary/1482094.

The free access to data can promote the involvement of scientifically interested citizens who, for example, may come to new insights due to a different perception of the given data (*citizen science*). This will not be desirable or advisable everywhere (nuclear research, gene technology) but, for example, hobby astronomers discovered extra-solar planets due to the free availability of data from the Kepler mission.[11]

Obstacles: After this excursion to the 'huge issues', let us now return to the small 'digital dream'. Why does not all that I hope for take place? Unfortunately, it is difficult to change traditions. In all the promises I mentioned, there are also always persons and groups of people who have something to lose. In the scholarly publication system, there are several groups that will suffer different losses: power, influence, jobs, business areas, and profits are at stake. Moreover, many of those who will be concerned by the changes are strong players in the publication system. Within this, a number of oligopolistic or monopolistic areas have been established which will be particularly hard to break up. Much has been written about this. I do not want to report again about the delaying tendencies that, first of all, come from the publishers. However, some libraries, editors of journals, authors, scientific societies or individuals also play a role in the delay of the transformation. In spite of this, I still see the sun rising because currently more and more traditionalists change their minds.

Strong OA mandates: The transition could be sped up through governmental measures. One possibility would be to make it an obligation for every researcher receiving public funds to publish their results open access (strong OA mandate). In this volume, Peukert and Sonnenberg argue that this would in principle not violate the freedom of research guaranteed by constitutional law, but the technological prerequisites for such a strong intervention in the existing system are not yet given. This could be solved, but it will take time and will most likely meet a lot of opposition.

E-print-archives and e-journals: From my perspective, the most important task is to conduct efforts of persuasion. What happens in physics, mathematics, computer science and related disciplines via the e-print service arXiv[12] is surely a role model. Preprint versions can (after an initial check) be deposited on the arXiv server to become generally accessible, and they may undergo the usual process of review afterwards. After a positive evaluation, they can be found in independent journals or overlay journals as evaluated publications. This entire process is transparent and can be cited. Similar procedures could be established in all disciplines or at institutional, regional or national level. This

11 See http://kepler.nasa.gov/.

12 See http://arxiv.org/.

would provide an important basis for the electronic publication system of the future, and indeed, such a development is already taking place.

So much has been written about the development and dissemination of electronic journals (e-journals) that I do not wish to repeat it. I would, however, like to point out a welcome development. Open Journal Systems (OJS) is open source software for the administration and publication of academic journals, which is continuously being developed further by different institutions and individual persons. The code is freely accessible and the program can be used free of charge. In Germany, OJS is used in the German Research Council project 'Sustainable OJS infrastructure for the electronic publication of academic journals',[13] in order to make the publication of electronic journals at universities easier and more permanent in the long term. This is an important step to advance the so far missing coordination.

Books: Books are a chapter in themselves and play very different roles in the different disciplines. They are of special significance in the humanities. Currently, the first electronic platforms for book publications in the humanities are being established. One example is the Berlin excellence cluster Topoi, which has developed a convincing new model with the *Edition Topoi*. Many areas of the humanities have been sceptical about digitisation, but change is in sight. This is particularly advanced by a younger generation to which dealing with IT is part of their daily academic work. Whether the model of electronic book platforms will be successful also depends on how strongly it is used by top researchers who – especially in the humanities – often seem to be of the opinion that the quality of a book corresponds to the quality of its publisher. It would be interesting to evaluate in this respect the experiences of the over 20 university publishers that have joined the university publishers common working group.

Data repositories: The data repositories necessary for open science will surely be established in reference to the needs of the different disciplines. This already happens globally in areas such as high-energy physics, astronomy and the geosciences, where enormous amounts of data are cooperatively stored and processed. Already in 1966, the Committee on Data for Science and Technology (CODATA) was formed in the framework of ICSU. CODATA is responsible for data management, making data accessible and securing reliable numerical data. This mainly takes place in the area of 'big science'. The activities, however, can also be used as examples for good practice in the establishment of 'data collecting locations'.

The coordinated establishment of disciplinary or regional repositories is necessary. 'Digital humanities data centres', which not only host publications

13 See http://www.ojs-de.net/index.html.

but also provide and care for useful programs as well as maintain databases and other data collections that require independent graphical user interfaces, would be especially important for the fragmented humanities. In this way, enormously useful value-added services (search tools, statistical and quantification tools, edition environments, automatic translations, alert systems, etc.) could also be offered that simplify the overall work effort. The Council for Information Infrastructure (RfII) has recently made excellent proposals for moving in this direction and establishing permanently funded centres for research data.[14]

Abuse and unintended side-effects cannot be avoided in networking, utilisation and provision of large data collections. The scientific repositories do not differ in this respect from other such data collections. Attention is necessary, but this is not a specificity of research data repositories. Continuous improvement of software tools helps to reduce potential dangers.

Dispersal and fragmentation: There is surely the danger of dispersal and fragmentation during the transition to the electronic world. One must not try to reinvent the wheel at every turn. Institutional vanity needs to be overcome, and more standardisation and collaboration should be advocated. The electronic collections have to cooperate in order to enable easy and efficient accessibility across the world.

Legal questions: Legal problems are of high importance. On this, the chapter by Peukert and Sonnenberg provides extensive detail. The digitisation of documents, of which the origin lies outside of the copyright protection period is, of course, possible – whether it is appropriate, however, depends on the discipline. For the future, publication agreements need to be made in such a manner that the described access to publications and the further processing of data are appropriately organised for OA use. Many are currently working on this issue. I am convinced that there will be a convergence to international standards in the near future. One problem, though, will be the establishment of OA access to the publications and data of the past years.

Strengths and weaknesses: The promises described above sound like a brave new world in which everything seems to work without flaws. Experience, however, shows that details are harder to control than the statements above may suggest. I am, nevertheless, optimistic that this new electronic open science publication system will prove its superiority over the traditional system in almost all disciplines and almost all relevant aspects.

Some challenges and problems should be pointed out, though.

Growth: The possibility of electronic publishing surely leads to growth in size that will not necessarily lead to an increase in quality. It may then become more difficult to find willing and competent reviewers. By applying diverse

14 RfII Empfehlungen 2016: Leistung aus Vielfalt, see http://www.rfii.de/de/category/dokumente/.

technological and algorithmic tools for the support of editors and reviewers, electronic publication systems can undoubtedly deal better with this growth than traditional ones.

Long-term archiving: For long-term archiving of digital research results, generally accepted standards and processes are still lacking even though this is being worked on intensively across the globe. In the debate about this challenge, however, one should not pretend that printed formats could survive in the long run. In this context, I should not need to mention library fires or the deterioration of paper due to acid or inappropriate storage. Costs (for example, for providing sufficient storage capacities for a growing number of paper documents as well as their air conditioning) start to burden the budgets of many institutions strongly. They lead to considerations about abandoning the traditional document inventories, even more so since the use of existing print documents continues to decrease. Being responsible for the budget of the BBAW with a library of 670 000 volumes and an archive with 6 000 running metres of documents with approximately 100 million manuscript pages, I know what I am talking about. Will anybody ever look at that? Digitised versions may be useful, but the digitisation of these many fragile documents is very expensive. The long-term archiving of electronic documents will make an active archive management necessary. I do not believe, however, that, once standards are agreed upon, the costs will be higher than maintaining traditional libraries and archives.

Costs: What about the costs of 'electronification'? Anybody who is familiar with this issue is convinced that the costs of an electronic open science publication system will be lower than the costs of the current system. Here, several synergy effects need to be lifted to balance the additional costs of electronic provision (networking, advice and support mechanisms, maintenance, etc.). Inferring from my experience, the existing library budgets are sufficient to finance the system in the long run. The transition period will be expensive since two systems need to be operated in parallel during this time and important organisational decisions have to be made. There will be 'allocation battles' and it needs to be clarified who pays for what in the long run. Libraries will, of course, not be abolished, but their role will have to be redefined.

Plagiarism: It is occasionally claimed that electronic availability will lead to plagiarism. Unauthorised copying has always existed, but the probability of being discovered has also increased since software is now able to prove plagiarism more easily than ever before.

Monopolisation: One danger is the monopolisation of knowledge by those who own the repositories. This problem can be solved by establishing a decentralised, international repository system in the public domain as well as

by respective contracts between the repository operators and their scientific partners and by mirroring of repositories (globally distributed copies of the databases). I am certain that there will be consensus at international level. Some critics say that such a publication system should only be accepted if it is verified through a system of binding multi-lateral contracts on the basis of international resolutions secured by supra-national criminal justice. One can, of course, put obstacles as high as one wants to. If I wanted to polemicise, I could add that also the abrogation of neutron bombs, espionage and IT terrorism needs to be called for since storage systems could be disturbed by them.

Print publications: Electronic publishing does not exclude printed publication at all. I read most articles in printed form and books almost always on paper. High-quality print on demand is nowadays cheap and of similar quality as traditional printing. Libraries can put the printed versions of books and journals on their shelves if they think it is feasible. If I, however, had to write this article without access to the Internet, I would not even have started because the search effort would simply have been too big.

BBAW and open access: Some words on the Academy. It is without question that many of the long-term projects of the BBAW collect, compile, transcribe and edit important material that, for a large number of historians, philologists, political scientists, literary scientists and others, is of enormous significance for their basic research. In the past, anthologies were produced in a costly manner (for example, in half-leather bindings). This may correspond to their significance but leads to high book prices and small circulation figures. Hardly anyone still buys such volumes. Admittedly, there are some bestsellers, but a detailed analysis of the sales, conducted in parallel by the excellence cluster Topoi, has revealed book sale numbers in the low three-digit area. One cannot speak of dissemination here. The electronic provision of this material of the BBAW in open access, wherever that was possible based on the contracts made long ago, has given access to a whole new set of readers and boosted research on these issues. When the entire Marx–Engels edition is completed in 10 years, hardly anyone will put the 114 volumes of the edited literary heritage of Karl Marx and Friedrich Engels on their bookshelf and read them all. Only the electronic availability and searchability of this incredibly extensive material makes it a user-friendly and useful collection of documents of high political significance.

Digital humanities: The mentioned OA efforts on behalf of the BBAW are part of the Academy's overall strategy to engage intensively in the field of digital humanities (see Grötschel 2015). Digital humanities (DH) is a brief description for the application of information technology in the humanities. In this context, the cultural and social sciences as well as some aspects of digital

art and media are often involved too because they, at least with reference to the use of information technology, analyse similar issues and work with similar methods. In DH, it is not about the simple use of computers but about the use of diverse tools of mathematics and computer sciences for the study of issues in the humanities. The globally diverse DH activities contribute significantly to the realisation of my digital dream. A wonderful overview of what currently happens in the digital humanities is provided by the 01/2016 edition of the journal *Akademie Aktuell* of the Bavarian Academy of Sciences with its focus on 'Digital Humanities: More than humanities with other means'.

Final remarks: Philosophers did not always have the correct vision, even if they were of outstanding significance. This, for example, is also true of Socrates who did not write, as we all know. Oral tradition would not have carried his thoughts into our current age. Fortunately, he had people who 'recorded' some of his ideas. In an unfinished manuscript on the Democritus tradition, Friedrich Nietzsche wrote:[15]

> We do not know why Socrates did not write and thus deprived the world of a clear image of his spirit: his reasons must have been of strange nature since we do not seem able to comprehend this form of ἄσκησις [exercise] through which he betrayed himself of a large pleasure as well as evaded the obligation, which is at the same time the right of outstanding thinkers, to influence the most distant mankind and to work not only for the current and limited but for all time.

I hope the great philosophers of our time will not only leave their thoughts on paper because I am convinced that they are even more useful if they are stored electronically. Essential, however, are the better possibilities of dissemination provided by the electronic open science publication system that have the potential to have a global effect and contribute to the passage of ideas in a vivid communication and thus to their endurance. It would be fine if, in a couple of hundred years, all the 'great philosophical ideas' could be found and accessed immediately, anytime, anyplace and free of charge.

15 See https://archive.org/details/gesammeltewerke02nietuoft.

References

Grötschel, M. 2001. Mein digitaler Traum. *Gegenworte*, 8:10–16. Retrieved from https://edoc.bbaw.de/frontdoor/index/index/docId/1091 [Accessed 15 April 2016].

Grötschel, M. 2015. Konsequent vernetzt: Digital Humanities und die Berlin-Brandenburgische Akademie der Wissenschaften. In M. Grötschel (ed.). *Die Akademie am Gendarmenmarkt 2015/16*. Berlin: Berlin-Brandenburgische Akademie der Wissenschaften, 14–23. Retrieved from http://www.bbaw.de/publikationen/jahresmagazin/jahresmagazin-2015-16 [Accessed 15 April 2016].

Herb, U. 2012. Offenheit und wissenschaftliche Werke: Open Access, Open Review, Open Metrics, Open Science & Open Knowledge. In U. Herb (ed.). *Open Initiatives: Offenheit in der digitalen Welt und Wissenschaft*. Saarbrücken: universaar, 11–44. Retrieved from http://eprints.rclis.org/17183/ [Accessed 15 April 2016].

Hoffmann, K.-H. 2016. Schwerpunkt: 'Digital Humanities: Mehr als Geisteswissenschaften mit anderen Mitteln'. *Akademie Aktuell: Zeitschrift der Bayerischen Akademie der Wissenschaften*, 01/2016

Peukert, A. & Sonnenberg, M. 2016. Das Urheberrecht und der Wandel des wissenschaftlichen Kommunikationssystems. In N. Taubert & P. Weingart (eds). *Zukunft des wissenschaftlichen Kommunikationssystems*. Berlin: De Gruyter.

Taubert, N. & Weingart, P. (eds). 2016. *Zukunft des wissenschaftlichen Kommunikationssystems*. Berlin: De Gruyter.