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OPENING THE BOOK ON OPEN ACCESS

WHAT RESEACHERS THINK

Royal Netherlands Academy of Arts and Sciences

OPENING THE BOOK ON OPEN ACCESS

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PREFACE

Our future depends on sharing research publications

The value of research publications cannot be underestimated. Papers and monographs are the result of a laborious, systematic, and mostly collaborative quest for facts, evidence, and analysis. The quality assurance system for research publications and scientific methods is rigorous and adheres to high standards that are under constant international scrutiny. All research publications together constitute the body of knowledge on which our societies are built. Our future depends on it.

It is a *conditio sine qua non* for the development of that body of knowledge that research publications be shared globally between researchers – preferably with as few limitations as possible. Not surprisingly, this has been the case for hundreds of years and this situation is unlikely to change. Researchers, essentially, should not need to worry about the accessibility of their work, although administrators may worry about rising subscription fees.

Over the past few years, the debate about 'open access' has increased in intensity. The proliferation of ICT, greater numbers of people attending higher education and the waxing importance of science in society have all supported the demand for unlimited access to research publications, in particular for the non-research community. In parallel, governments are looking for a bigger return on taxpayers' investment, funding organisations increasingly require open access, and private sector publishers are reinventing their business models. Lately, researchers have started to worry how all of this will this affect their work and career.

For the past couple of years, the open access debate has been dominated by university administrators, librarians, government, funding organisations and publishers. Voices of researchers are seldom heard in this debate. That is why the Royal Netherlands Academy of Arts and Sciences wants to shift the focus a bit by initiating this booklet. It contains an illustrative number of interviews with outstanding researchers in a variety of disciplines. As it turns out, their opinions vary quite a bit, making the interviews a very interesting read indeed.

Weighing up all the pros and cons, and regardless of the eventual outcome of this debate, I would like to point out two things. First, whatever the final policy terms will be, let's make absolutely clear that the open access principle is ultimately beneficial to research and society. And second, let's keep in mind that knowledge is not the exclusive privilege of researchers or academics, and that everyone in society has a right to access results paid for by taxes. Our future depends on it.

José van Dijck
President
Royal Netherlands Academy of Arts and Sciences

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1. INTRODUCTION

The Netherlands holds the Presidency of the Council of the European Union from January to June 2016. One of the topics that it will be dealing with during that period is 'open science', which includes open access to publications. A number of meetings on that topic have been organised for various interest groups, such as university libraries, policymakers, research funding bodies, and publishers. But what has been missing so far are the voices of the researchers themselves. The Royal Netherlands Academy of Arts and Sciences ('the Academy') believes it is important for those voices to be heard and therefore arranged interviews with 21 researchers on the topic of open access. The results of those interviews are recorded in the present booklet.

The 21 researchers were selected from various disciplines, are in different stages of their scientific career, and have a variety of opinions about open access. We selected seven members of the Academy's learned society, seven members of The Young Academy, and seven young researchers (PhD candidates and postdocs) from the Academy's institutes. They were interviewed in a private capacity, and the opinions that they express do not necessarily represent the views of their employers.

This booklet consists of two main sections. The first comprises the interviews with the researchers and the second, the epilogue, provides a brief analysis of the interviews. The appendices provide background information on open access and a list of the researchers interviewed. The interviews are presented in alphabetical order (by surname).

Some findings from the interviews

- It is important for science to be accessible, not only for the researchers themselves and for scientific education but also for society as a whole and for 'the citizen'.
- Making 'green' or 'gold' open access mandatory will greatly boost the movement towards open access.
- There are major differences between the disciplines.
- In some disciplines, open access is not an issue because researchers publish their work in open access repositories.
- The quality of publications has the highest priority, and open access does not in itself offer any guarantee for quality.
- Research assessment is still too heavily based on closed access leading journals with a high impact factor.
- The charges associated with open access publishing are still too high for researchers, and the process is often cumbersome.
- There is a great deal of uncertainty regarding the requirements and possibilities of open access.

2. THE INTERVIEWS

2.1 More support needed

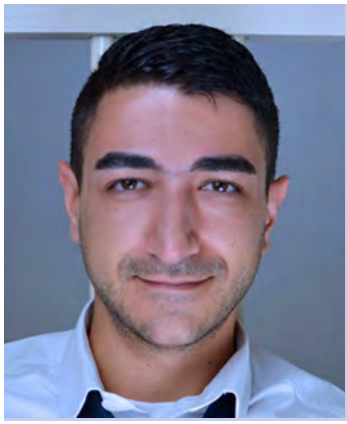

Photo: Saman Ashkpour

Ashkan Ashkpour (1984) is a PhD candidate in social history at the International Institute of Social History (IISH) and the eHumanities Group in Amsterdam, and is affiliated with Erasmus University Rotterdam.

Everyone says they support open access, but nobody can afford it.

Eighty percent of the knowledge within my field is to be found in just two or three leading journals, all of which are closed access. I want to publish in those journals because they are read by the community that I wish to belong to. There are also a number of new, entirely open access journals, but a researcher who is just starting out can't risk opting for an open access journal that doesn't have an established reputation. It's also questionable how long such a journal is going to survive anyway. My feeling is that the work published in such a journal has less impact.

No money available

Everyone says they support open access, but nobody can afford it. When I wanted to make one of my articles in a closed access journal openly available, it was extremely difficult to get the necessary money. I'm affiliated with three research institutions, all three of which said they thought it was a good idea and that they would look into it. However, it turned out to be very difficult to actually find money for me to publish in the open access journal. Altogether it took a whole lot of e-mails and meetings before we could eventually get the charges paid from the project budget.

I also found that there was a lot of confusion about what's possible. Neither the senior researchers nor the PhD candidates – nobody! – knew exactly what funds were available to cover charges of that type. It would be convenient if there were a central source with information about practical issues regarding open access. I didn't know, for example, that deals had already been made with publishers. I think that that kind of information needs to be made available not just to administrators but also as directly as possible to the individual researchers themselves. There also needs to be greater transparency about the procedure for open access. What can we expect, when does/doesn't a researcher meet the requirements, and where are exceptions possible?

Open data but no open publications

In my own discipline, we work a lot with open data. My research, for example, is based on publicly accessible social history data. But the publications about that data are closed. That's naturally rather strange. I also think that your work is accessed more if it's free. As soon as my article came out from behind the payment barrier, it was clearly read and cited more widely.

As far as I'm concerned, we should start by encouraging the hybrid type of open access. And as the new fully open access journals become more mature, we could then gradually switch over to them. Perhaps senior researchers ought to take the lead in that respect. The risk is less for researchers who already have an established reputation. I anticipate that open access publishing will eventually become the norm. But I do think we need to take our time.'

2.2 Not a big issue

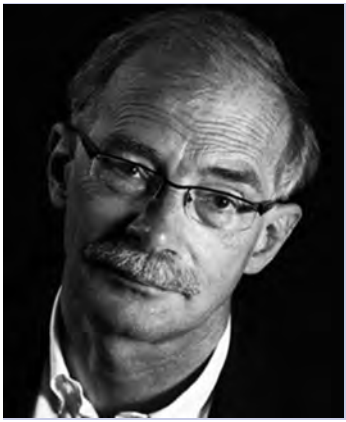

Photo: Henk Thomas

Jan Bergstra (1951) is Professor of Theoretical Informatics at the University of Amsterdam and a member of the Academy.

Writers live on in their work, and that applies in the scientific world too.

'In my field, informatics, open access publishing is not actually an issue. We don't talk about it much. If you want, you can make all your articles publicly available yourself through the free online arXiv.org repository. All the publishers have agreed to that.

I get rather irritated about the prevailing sentiment directed against the publishers. They've sometimes been in the business for hundreds of years, and all along they've changed with the times. They're now also doing that where open access is concerned, although they understandably want to do so at their own speed and on their own terms. Given that Elsevier and Springer often agree that publications published in their journals should also appear via arXiv.org, I think they deserve some credit.

Journal based on open archive

Personally, I no longer publish in the leading journals, which are often closed access. Over the years, I've published five articles in the best journals in my field, and that's enough. It takes too much effort to get an article accepted by them and it's just not worth it to me anymore. Perhaps I just don't have the patience now. I'd be happy just to publish via arXiv.org. Completely open access electronic journals are now appearing that are based entirely on that archive. You simply create an additional software layer that picks out the relevant articles and circulates an e-mail with the links to them.

I don't think every publication needs a mark of quality. Either I can't follow it and so it's not intended for me, or I do understand it and then I can decide for myself whether I think it's good work or not. Peer review filtering still plays too

big a role at the journals, and there's hardly any room for research that may not be absolutely top class but is still good solid work.

I do still publish in mainstream journals, partly because my fellow authors still believe strongly in doing so. It's perhaps less obvious in other fields and for people at a different stage of their career, but I think a researcher should be able to choose to not only publish in certain journals.

Western European view

I myself am an editor of a number of journals. They aren't all open access, but in the long run they will probably become so – the movement is already underway. But I won't mind if they don't. Here in western Europe, open access is an important issue, but as far as I can see it isn't actually like that in Asia. There, journals still gain a certain status if libraries in the west have taken out a subscription to them.

For me, the main reason to publish in open access journals isn't so much responsibility vis-à-vis the taxpayer. It's because colleagues are now unable to read some of my work because libraries are increasingly cancelling subscriptions. Not a day goes by that I can't access certain journals myself. Writers live on in their work, and that applies in the scientific world too. But then, what you write has to remain accessible.'

2.3 DIY

Photo: Milette Raats

Antal van den Bosch (1969) is Professor of Language and Speech Technology at Radboud University Nijmegen, Research Director at the Centre for Language Studies, and a member of the Academy.

We've already had the digital revolution and you no longer need much in the way of staff.

'Scientific knowledge should be openly accessible to everyone. And yes, that includes "the man in the street", because he may be an entrepreneur with a university degree who wants to know all about the latest developments in his field.

As far as I'm concerned, we don't need publishers. But I'm definitely not opposed to them; if they come up with a good proposal, they can certainly add something. But if we want to, we can start up our own journals just fine. We've already had the digital revolution and you no longer need much in the way of staff. With a journal management system, you can automate almost everything, from submission of the articles to a double-blind peer review process. Editorial boards and reviewers generally work for free already, so perhaps you only need to pay for the main editor's support staff.

Role for professional associations

Professional associations can play an important role here. In my own field, we have a strong professional association, the ACL (Association for Computational Linguistics). It publishes conference proceedings, which are very important for the field. And it also publishes two journals. One of them – which the ACL publishes itself – is entirely open access, while the other is published by MIT Press. A little while ago, the association managed to arrange for those articles to be entirely open access too, retroactively. You don't have to pay – either to publish them or to read them.

From impact factor to citations

When you propose starting up a new journal, there's immediately a discussion about its impact factor. But impact factors are an odd way of measuring the quality of individual publications. A journal's impact factor is determined by a leading group of top-notch articles. But you sometimes come across totally mediocre articles in so-called "leading journals".

Citations are a much more direct way to measure quality. In my own field, it's not always peer-reviewed publications that are cited most but often technical reports or software reference guides. And in the humanities there are sub-disciplines that don't focus on journals at all; rather, it's monographs that count.

Raising awareness

The current situation regarding open access publishing is chaotic, and that scares people away. I think the most important thing to do is to make researchers aware of the possibilities, because if they see examples of how things can be done, they automatically become enthusiastic. I myself am participating in a large-scale EU project, FutureTDM.[1] One of the project partners is an entirely open access publisher that has developed a new business model that is as light and inexpensive as possible. That means it can also minimise the publication charges. To me, that seems like a challenging task for the publishers, namely to try to develop a business model that is attractive for researchers and that allows the company to still make a profit.'

1 http://project.futuretdm.eu/

2.4 Well organised via free repository

Photo: Henk Thomas

Alexander Brinkman (1975) is Professor of Quantum Transport in Matter at the University of Twente and a member of The Young Academy.

I think it's a good thing to point out to researchers within my field that this means that you immediately satisfy all the demands of the research funders.

'In my field, physics, open access publishing is very well organised. From back in the 1990s, we've been using the arXiv.org open repository, which is where my own articles are publicly available. I generally upload the final version after the review process. All that's missing is the final formatting that the journal looks after.

This represents an ideal kind of open access: you can publish free of charge and read all the articles free of charge too. The system gives you a clear overview of the different versions of an article if the author has uploaded them. We therefore have no problems with copyright or embargoes, even with the most important journals in our field, namely *Nature* and *Science*. There are no publishers or libraries in the middle – the archive is managed by Cornell University in the US.

Double-entry bookkeeping

The only downside is that you basically need to operate a system of double-entry bookkeeping: you need to submit your article not just to the journal but also upload it yourself to arXiv.org. People don't always do that properly. Personally, I always do it with all my publicly-funded research, because I think that the results of such research should be available to the public. I think it's a good thing to point out to researchers within my field that this means that you immediately satisfy all the demands of the research funders. That makes a big difference in charges and hassle with publishers.

A repository like arXiv.org will never be able to replace the traditional journals. Basically, anyone can post anything they like in an online environment like this, which means that you don't have a filter to separate good work from bad. So

many articles are being produced every day that it's impossible to read everything, even for your own particular field.

Mark of quality

Traditional journals like *Nature*, *Science*, and *Physical Review* play an important role in providing a mark of quality. I use them to separate the wheat from the chaff and to see which publications I definitely need to have read. Conversely, I also use them to demonstrate to other researchers that my own work is of high quality. If you were to set up a completely new open access journal with the same rigorous peer review process, it would still take a long time before it managed to achieve the same reputation. Don't forget that *Nature* and *Science* have taken more than a hundred years to get to where they are now.

Stay aware

I think the only threat posed by this system is that of the repository finding its way into commercial hands. The system is now still based on donations. I think that governments and organisations like the Academy, the Association of Universities in the Netherlands (VSNU), and the Netherlands Organisation for Scientific Research (NWO) need to ensure that that remains the case, and if necessary they could contribute. But that certainly doesn't apply just to the Netherlands. A large-scale archive like this is of international importance. ArXiv.org is a splendid repository of all physics research, which is freely accessible around the world.'

2.5 Make science comprehensible for a wider audience

Photo: Richard Bank

Ellen Dingemans (1986) is a postdoc sociology researcher at the Netherlands Interdisciplinary Demographic Institute (NIDI) and is affiliated with Groningen University Medical Centre.

I think that we scientists need to make our knowledge comprehensible for the public. That involves more than just making your articles freely available.

'Taxpayers should have free access to the knowledge that they pay for. That's an argument that I often hear when people are talking about open access. I agree, but I don't think that providing access to research articles is the best way to go about it. Some research publications are difficult even for fellow researchers to understand. I think that we scientists need to make our knowledge more comprehensible for the public. That involves more than just making your articles freely available.

For example, my research on retirees who continue working has been cited in a memorandum for the Dutch parliament. It wasn't the original English-language article in an international journal that was cited, however, but a popularised Dutch text that I had written with some colleagues for *Demos*, our institute's widely read house magazine.

Dissertations take a long time to go online

None of this means that the current situation doesn't need improving. For example, I'm making arrangements with the University of Groningen to put my dissertation online, but that's only allowed after the end of the embargo periods for the internationally published articles that it contains. For some articles, that will take a while, which means a missed opportunity. Needless to say, it's around the date when you get your PhD that there's most interest in your dissertation.

I recently made one of my closed access publications openly available. It was an article in a high-quality journal and there was money to cover the publishing charges. We wondered what that would mean in terms of citations, because that's what you look at, certainly if you're just starting your research career like

me. My next job depends on my citations and not whether my neighbour can read my articles at his leisure.

Difficulties for PhD candidates

If your supervisor or your institute doesn't alert you to the options for open access, you as a PhD candidate won't quickly discover those options by yourself. Just getting your first article published is already complicated enough! I think creating awareness is therefore an important first step if you want to get young researchers involved.

The State Secretary for Education, Sander Dekker, has said that by 2024 all articles produced by Dutch researchers must be entirely available by open access. But when I read the relevant arguments, I get the feeling that there is still no consensus on why we want it and how to go about it. If the main purpose is to give the public access to information which has been generated using public money, then for the time being I prefer other ways of achieving that.'

2.6 Ensure standardisation

Photo: Milette Raats

Andrea Evers (1967) is Professor of Health Psychology and chair of the Health, Medical, and Neuropsychology unit at Leiden University, as well as a member of The Young Academy.

Payment barriers are an obstacle to scientific education.

'Open access publication is still problematical in actual practice. You often have to pay a lot of money to publish in that way. For my own research group, that's not really such a problem, but 1500 euros per article, on average, is quite a sum if you have to pay it out of your own pocket. That restricts researchers who don't have the necessary funding for open access publishing.

Problem with finished projects

But even if you do have the money, you still sometimes come up against administrative problems. For example, I recently finished off a VIDI project. There are a lot of publications at the end of a project like that. But the project budget has been finalised, meaning that I can no longer claim the publication charges that have to be paid. And because I think that kind of administrative hassle shouldn't be a barrier to publishing in the journal of your choice, I decided – as chair of the department – to set aside a budget for cases like this. I think that everybody in my position should do that for the time being.

Then there's the lack of standardisation. It takes a lot of time to find out who has what open access rules. It's all very inconsistent, and it also changes every month. *PLOS ONE*, for example – an entirely open access journal – requires that you immediately also make your database openly available. Or co-authors have to suddenly fill in exhaustive questionnaires before an article is even considered. All this means that researchers lose two days submitting an article to a specific journal – time that they could be spending on their research!

Open knowledge needed to build bridges

But I still think it's very important to continue our efforts to make open access possible. And things are in fact moving: a nice new contract was recently concluded again with the publishers. The basic principle should be that the products of scientific research should be freely accessible. If we want to build bridges between science and the community, education and healthcare, then freely accessible knowledge is the prerequisite.

What I miss in the current discussion is the fact that payment barriers are an obstacle to scientific education. A dynamic instructor will want to encourage students by showing them recent research. But he or she can't distribute complete articles, only a link to the published version on the publisher's website. So a student can then only read the article if he or she is connected to a university network and the library has a subscription to the relevant journal.

Pragmatic

For the moment, I'm adopting a highly pragmatic stance. After all, I'm not rated according to the accessibility of my articles but according to their quality and the impact factors of the journals in which they're published. Given my conviction that open access is in fact going to be introduced for standard journals, I'm continuing to publish in high-quality journals. So for the present, I'll just need to pay extra to make may articles freely accessible.'

2.7 Absolutely normal

Photo: Mentje Dijkstra

Lude Franke (1980) is Associate Professor of Systems Genetics at Groningen University Medical Centre.

The trend towards open access is in fact unstoppable.

'Frankly, I'm surprised that open access publishing is still a matter of debate at all. In the life sciences, it's now possible with most journals and we can finance it with funds provided by NWO. And that's not just in the Netherlands. The US National Institutes of Health and the British Medical Research Council and Wellcome Trust have even made open access publishing mandatory.

For the past eighteen months, we in the life sciences have had "bioRxiv.org", which is something like the arXiv.org system for physicists and mathematicians. You can upload articles to bioRxiv.org – which isn't commercial – even before they are accepted by a journal. I myself am making good use of that arrangement. In my field, speed is of the essence because competitors are lying in wait. An archive like bioRxiv.org allows you to post something as soon as you've discovered it. Conversely, it enables you to keep up with what those competitors are doing so you're not just duplicating their work.

Rapid development

Until about six months ago, it could sometimes be problematical if you submitted an article to a journal that was already available via bioRxiv.org. Some journals would refuse to consider it then. But they've now all changed their mind. I even see citations directly to the archive – people no longer wait for the published version.

With many current journals, the publisher doesn't really add much to an article because the editors are mostly fellow researchers. In cases like that it would then be fairly easy for such journals to switch over to having a free online version. But most journals in the *Nature* category do in fact have clear added

value: the editors really do improve the texts, and the journals spend a lot of time polishing up the illustrations. Even so, those journals also recognise that a different revenue model is going to take over eventually. I recently talked to one of their editors, and she now intends setting up an entire range of new open access journals under the *Nature* banner.

Leading the way in the humanities

So in my day-to-day work open access publishing is perfectly normal and discussion of it is perhaps already passé. But I do realise that things aren't yet arranged very well, especially in the humanities and the social sciences, and that researchers feel they are currently being pressured to publish in open access journals that are less well regarded. I think it's important for the Netherlands to lead the way in that respect, because I think the trend towards open access is in fact unstoppable.

Let me give you an example. Recently there was a remarkable editorial in the *New England Journal of Medicine* in which the authors used the term "research parasites" for people who reused other people's research data. The worldwide response to the editorial was so overwhelmingly negative that the authors were forced to apologise. So the writing's on the wall.'

2.8 Publishers are leading the way, but slowly

Photo: Milette Raats

Janneke Gerards (1976) is Professor of European Law at Radboud University Nijmegen and a member of the Academy.

At this point, mandatory open access would discourage researchers from publishing about Dutch law.

'As far as I can tell, open access is absolutely not a topic of discussion in the field of law. That's really problematical, because for us it's in fact a highly relevant discussion. Academic study of the law is intimately related to actual legal practice. We write a large number of legal commentaries and annotations on court rulings, and they're important for practising lawyers. But those commentaries and annotations appear only in closed journals and databases. For a small law firm, subscribing is far too expensive. The publishers are now starting to understand that problem. The number of subscribers is falling and so they are starting to think about other revenue models. But it doesn't yet amount to much – they haven't got much further than just chitchat.

Nearly all the high-quality journals in my field are closed access, and they don't yet offer any options for making articles open access. We also publish a lot in collections, for example at Oxford or Cambridge University Press. If a funding body suddenly makes open access publishing mandatory, then the researcher has an acute problem.

Development of Dutch law at risk

But there are ways of getting around the problem. Researchers are increasingly making PDFs of their articles available through their own website or through sites like Academia.com. For articles in English there are now online archives where you can post unpublished versions of your articles, such as the Social Science Research Network (SSRN).

But there are almost no open access options for Dutch-language articles about Dutch law. At this point, mandatory open access would discourage researchers

from publishing about Dutch law, which is highly undesirable in terms of its development. To me, it seems only right for the organisations that fund research to try to change things, for example by engaging in dialogue with the relevant publishers.

Where dissertations are concerned, there's another practical problem. PhD candidates are already often required to immediately make their dissertation – which in our field is often a lengthy monograph – available online. But then they can't find a publisher that will bring out the dissertation as a book. Why would it, if anybody can download the whole thing from the Internet free of charge?

First steps already

But things are slowly starting to change in our field too. For example, I'm on the editorial board of a number of Dutch-language journals. At one of them we immediately agreed with the publisher, when it was first set up, that the entire journal would be made available online, free of charge, six months after publication. At another journal, we're still thinking about it. It's already pretty certain that that journal will be open access. All we still need to decide is whether there should be embargo period and, if so, how long it should be.

Unlike in other disciplines, there's hardly any trend towards open access in the field of law. As long as we can just read all the articles ourselves, we're rarely confronted by the fact that our knowledge remains too much within the walls of the university.'

2.9 Why would we want it?

Photo: Milette Raats

Wilhelm Huck (1970) is Professor of Physical-Organic Chemistry at Radboud University Nijmegen and a member of the Academy.

My research isn't secret anyway. Anyone who wants a copy of my articles can get it from me.

'As far as I'm concerned, mandatory open access publishing is primarily a burden. If I myself have to pay to publish an article, it feels like I'm placing an advert. The result is that I'll publish less, and refuse invited reviews, for example. I can only spend my money once. Part of the money that was intended to cover the direct cost of research will then go to commercial publishers. I think that's a bad thing.

No sensible arguments

I'm certainly not against open access, but I haven't heard any sensible arguments as to why we should want it. To say that the taxpayer should be able to read my articles to see what's being done with his money is absolute nonsense. I have absolutely no illusions that my articles will be read by different people to those who read them already. Most scientific articles are written for fellow researchers, in a language that laymen don't understand. Moreover, my research isn't secret anyway. Anyone who wants a copy of my articles can get it from me.

The argument that an article is cited more often if it's open access is completely unsubstantiated. That will mainly be the case with articles that are cited zero times, and that figure will rise to probably just one time. As a percentage increase, that's gigantic of course, but it's relevance is nil. For the journals in which I publish it will probably make no difference.

Political choice

I have the unpleasant feeling that this discussion is being driven mainly by politicians who have jumped on the "science must be useful" bandwagon.

Researchers are being depicted as people who secretly use taxpayers' money for their own little hobby projects – whereas we are in fact trying to answer interesting and important questions.

As far as I'm concerned, the system of journal subscriptions is just fine. Every other researcher can access my publications, and I can read everything that's relevant. Good journals serve a number of functions. They group and assemble articles by field, and they also select from them. A publisher acts as a mark of quality, and that's backed up by a robust peer review process. That system is under pressure, but it's still better than nothing. Moreover, the reputation of such a journal ensures that your community becomes well organised.

Payment per article downloaded

Yes, some journal subscriptions are expensive, but you can let the market do its work. If nobody wants to pay for a journal any longer, then it will automatically cease to exist. If you want to change something, it would be better to look for alternative revenue models. Maybe we should create a kind of "iTunes" for articles, so that you pay per article that you download. That wouldn't be the sixty dollars that you have to pay if you don't have a subscription, but just one or two euros. The current situation also makes things worse for the taxpayer. He or she now pays double: for subscriptions for universities and for the publication charges to make articles openly accessible. So ultimately we collectively spend more on all the publication charges than on the subscriptions that we currently pay.'

2.10 On the wrong road

Photo: Hanneke Vriens – Bart Koetsier

Marinus van IJzendoorn (1952) is Professor of Education and Child Studies at Leiden University and Erasmus University Rotterdam. He is also a member of the Academy.

This requirement hits the weakest link in the system, namely the researcher, who has no choice and has to do what the funding agency says.

'I am totally opposed to open access – or at least the road towards it that has been chosen. The Netherlands is positioning itself as one of the trendsetters, but I'm afraid the result will be that in a few years we'll be riding at the back of the pack.

That a funding agency like NWO is now requiring researchers to publish by open access is harmful, especially for the impact and reputation of young researchers. It is forcing them to publish in second-rate journals. And armed with that list of publications, they'll have to compete against researchers from abroad for postdoc positions. This requirement hits the weakest link in the system, namely the researcher, who has no choice and has to do what the funding agency says.

A tsunami of journals

There's currently a real tsunami of new open access journals. In just the past few weeks, I've received requests from 88 completely unknown journals. They ranged from invitations to become an editor or associate editor to invitations to write a brief report. They all promised that they could do a full review within just a few days. And of those 88, there were only 17 that had any kind of impact factor at all.

It's totally unclear to young researchers what the quality of the various journals is, and it's also questionable how long all those new journals will continue to exist. You may find yourself publishing an article that will end up dead and buried. Publication lists are becoming increasingly meaningless. For example, I recently received a job application from someone whose list of publications

consisted entirely of unknown titles. I had to spend extra time finding out whether those articles actually amounted to anything.

I'm worried that we're heading for an amorphous system in which nobody can find their way around. Prestigious journals are essential to separate the good work from the junk. And because my field of research is extremely multidisciplinary, I need the peer review to make sure an article is also well put together in terms of its methodology.

Some of those open access journals also require that you immediately submit your database too. In my kind of research, which concerns people's personal data, that's by no means always possible. I have to deal with a medical ethics committee, and with very strict privacy laws.

Start with the US

If you really want open access to be a success, you need to start with the major journals and the North American universities. As long as those leading universities stick to the old model, it won't make any difference whatsoever to such a publisher if we – the Netherlands, or even Europe – decide to boycott its journals. In my opinion, we ought to take the longer and perhaps more difficult road, which will do more justice to the way science actually works.'

2.11 Two entirely different cultures

Photo: Richard Bank

Folgert Karsdorp (1983) is an ethnology PhD candidate at the Academy's Meertens Institute and is affiliated with Radboud University Nijmegen.

It took more than a year, several meetings, and hassle with lawyers to arrange that the book would also be openly available.

'My research has to do with machine learning on the one hand and with the humanities on the other. There are major differences in the publishing culture in those two fields. In the case of machine learning, everything is as open as possible. Besides publications and data, it's also becoming more common to make software code openly available. The machine learning community believes that science will progress faster if you can build on the work of others, and that's why you should make your research openly available as far as possible.

In the humanities, however, everything is a lot more "closed". Leading journals sometimes even impose embargoes lasting one or two years if you still want to make an article openly accessible. And there are in fact few open access alternatives. I've published a number of articles in closed access journals, so that my research is available to the humanities community.

Different requirements for articles

Those journals did impress me, though. They apply strict procedures, have faster lead times than you might expect, and they come up with substantial improvements on the first version that I submitted. Of course, the requirements that different disciplines have for an article also vary considerably. To overstate it a bit: in the proceedings of language technology conferences, it's mainly important for the model descriptions and the associated results to be written up clearly. It's often the formulas, tables, and figures that convey most of what you want to say. It doesn't really matter if they aren't contextualised in the very best English language. But in the humanities language use is crucial. A good editor makes sure that your arguments are formulated clearly and that the line

of your argument is unambiguous. That means that the editor really does have added value.

At the moment we're clearly in a transition phase regarding open access, and that can sometimes produce awkward situations for researchers. To give an example: I recently signed a contract for a book to be published by Princeton University Press. With two colleagues, I'm going to produce a handbook for the digital humanities. All in all, it took more than a year, several meetings, and hassle with lawyers to arrange that the book would also be openly available.

That's a great result and I'm proud of it. But the long lead time is problematical for me because my appointment will soon be ending. So I will now have to write the book in my spare time while working in another job.

Responsibility to science in general

Interestingly enough, the decisive argument for the publisher was that the university where one of my fellow authors works has made it mandatory for publications to be openly available. That reinforces my belief that imposing obligations is the only way to get things moving. It's true that an obligation like that may be detrimental in the short term, especially for PhD candidates . We still need the traditional journals to attract attention. But in my opinion, even if you're just a research assistant you still have a responsibility to science in general, and you need to aim for long-term gains.'

2.11 Better provision of information

Photo: Studiozero / Hans van den Heuvel

Jan Kuiper (1987) is doing a PhD on aquatic ecology at the Netherlands Institute of Ecology (NIOO) and is affiliated with Wageningen University and Research Centre.

New journals offer opportunities for researchers from developing countries.

'My research touches on major social issues such as climate change and declining biodiversity. As many people as possible – whether they're fellow researchers, journalists, or politicians – should therefore be able to acquaint themselves with my results.

Half of my twelve current publications are therefore openly accessible. Which journal I want to publish in depends on the topic and the audience that I want to reach. Articles about water quality measurements need to be accessible for water managers, so in that case I decide on open access. The same applies to publications on new computer models, which can play an important role in improving water quality. But for articles on more fundamental ecological issues, I mostly aim to publish in prestigious journals. The impact factor is still important to my future scientific career in that field.

If you really want to encourage open access publishing, I think you need to assess the quality of researchers differently. Assessment still focuses too much on articles in a few leading journals, whereas I think that the societal impact of a researcher needs to be taken into account as well.

Order in the chaos

It's great that the Netherlands is standing firm in negotiations with publishers, but researchers need to be better informed about those negotiations. I only found out by accident recently that there is already a deal with Springer that will be very useful for me. On the whole, researchers find it hard to see the wood for the trees. Lots of new open access journals are emerging, but how am I supposed to know which ones are any good, with a reliable review process, and

reasonable lead times? It would be a good thing if there were a single source where you could find that kind of information.

I myself was recently asked by one of those new journals to review an article. I had some time available, so I thought it would be nice to give something back to the world of science. It turned out, however, that the article had some major shortcomings, and I advised that it should not be published. Imagine my surprise a few weeks later when I got to see the journal concerned – with the same article in virtually unedited form. It was only then that I discovered that there are blacklists, and that that journal was on one of them.

More knowledge available

But there are also positive aspects to those new journals. For example, they offer new opportunities for researchers from developing countries. Prestigious journals often receive so many articles that they can select only the best ones. That's very nice, but it also creates a barrier for researchers who need to carry out their research with less sophisticated equipment. In the context of changing biodiversity, for example, African countries are a big blank spot. As long as the research by my colleagues over there is robust and reliable, both science and society would benefit if we could read more about it.'

2.12 How do I pay for it?

Photo: Milette Raats

Hanneke van Laarhoven (1973) is Professor of Translational Medical Oncology at Academic Medical Centre (AMC) in Amsterdam and a member of The Young Academy.

That research is unfunded. But if he decides to publish by means of open access, I'll still have to come up with those few thousand euros per article somewhere.

'In my field, medical oncology, most of the leading journals are not yet open access. The fully open access journals out there don't have an impressive impact factor. And that's simply essential for your career, not just for getting personal grants but also if you want to form consortia, or for the periodic review of your contract. There's increasing pressure to have a good list of publications.

The great majority of my own publications are therefore behind a payment barrier. When choosing a journal, I consider which one is most suitable for my article, and what its impact factor is. Whether the final article will or will not be openly accessible isn't an important consideration.

Charges not budgeted for

At the moment, there are a number of obstacles to open access publication. Besides the lack of open access journals with a high impact factor, the problems are mainly financial. My main research funding body obliges me to make the resulting publications openly accessible, but I'm not allowed to include the associated charges in my budget. And we're talking about charges in the order of 1500 to 3000 euros, so I can't just "find" that money somewhere.

This problem is even more relevant in the case of research for which no money is available at all. I have a colleague here, for example, who's doing a major review of the literature in his own time. That research is unfunded. But if he decides to publish by means of open access, I'll still have to come up with those few thousand euros per article somewhere. How that's supposed to happen in countries with little or no money for research anyway is a real mystery.

Better access helps the advancement of science

Basically, I'm very much in favour of open access. By the way, that's not primarily because of the usual accountability argument. I have absolutely no illusions that my articles will suddenly be read by the neighbours with the idea "Let's see what Hanneke's doing with the money we pay to the taxman." For me, a more important consideration is that open access will help the advancement of science overall. I regularly get e-mails from colleagues who have seen that one of my publications is available on PubMed but who can't read it because they don't have a subscription to that particular journal. So of course I send them the PDF, but it's a bit strange that I need to do that. Open access helps the dissemination of knowledge and thus scientific progress.

Joint negotiations

As far as I'm concerned, the existing high-quality journals should be open access, and there should be a source of funding somewhere to finance the necessary publication charges. In the same way as Dutch universities now negotiate with publishers about subscriptions, they can perhaps negotiate collectively about publication contracts. And maybe that should be on an even broader scale, and the EU should also sit down at the negotiating table with the publishers.'

2.14 Good journals improve an article

Photo: Milette Raats

Johan van Leeuwaarden (1978) is Professor of Mathematics at Eindhoven University of Technology and a member of The Young Academy.

ArXiv.org is a useful archive, but it's no more than that.

'In this age of Internet and social media, can you really withhold new knowledge? I don't think you can – it's a matter of principle. Take medical research. If you've made a discovery that can enhance the effectiveness of a drug, it's almost immoral to keep that knowledge to yourself. Even so, open access publication doesn't yet play a major role for me personally. But I'm hearing more and more about it, and it's becoming an increasingly important issue. But when I have to choose where I'm going to submit an article, I still look mainly at the contents of the relevant article and the reputation of the journal concerned.

Openly accessible via a repository

It's not in fact all that difficult in my own field to publish articles so that they are freely accessible. There are a number of really good journals that are published by non-commercial organisations. And virtually all my work is also available on arXiv.org, an American free online repository. ArXiv.org is convenient and has a low threshold. My articles there often fall into two or three categories, which makes them easier for my colleagues to trace than in the dozen or so different journals in which they appear later. You can also post various different versions, so that you can still change things.

But we shouldn't romanticise arXiv.org. It's an archive, a database where you can store and trace articles. But it's also no more than that. It isn't edited and there's no peer review process.

Substantive editing

At the moment, the debate is mostly about the big profits that the commercial publishers make. I see that too, but I also think we need to be careful not to lose sight of the positive aspects of the existing journals. A good journal certainly improves your article, not just by formatting it and promoting your work, but also by looking at the actual substance. There are plenty of journals where not only the peer reviewers but also the editors make good suggestions. I find that support from the publishers very valuable, as long as it's provided for an appropriate fee.

Negotiations are currently ongoing with publishers such as Elsevier. And perhaps that's in fact justified given the Dutch roots of that company. But if you really want to change something, I think you need to get the major scientific societies like the American Physical Society or INFORMS on your side. They are powerful organisations with prestigious journals. If they decide to apply a different funding model, other more commercial publishers may well follow.'

2.15 Towards genuinely open research

Photo: Kevin Moerman

Elizabeth Moloney (1985) was until recently a postdoc researcher in neurosciences at the Netherlands Institute for Neuroscience (NIN). She is now a postdoc researcher at McLean Hospital in Boston, Massachusetts.

The more that research takes place in the open, the easier it is to correct errors or faulty assertions.

'I look up and read scientific articles on the Internet. The quality of the research is far more important for me than which journal it's published in. Because you can find articles digitally, I think that printed editions have actually become superfluous. And it's outdated to have to pay if you want to read such an article.

All research results should be accessible for anyone. After all, they serve the public interest. I also think that the entire process of scientific publishing ought to be fast and transparent – which the closed, often slow, and anonymous review process at many journals isn't! I myself recently published an article in *Frontiers in Neuroscience*, which is an open access journal. The final article identifies the peer reviewers by name.

A 'wiki' for science

Why would a reviewer want to remain anonymous? Surely science revolves around criticising and being criticised? Research is all the better for it. Some new publication platforms like The Winnower, F1000, ScienceOpen, RIO, and PubPub are also increasingly "wiki"-like in their setup. Articles are immediately online and open to discussion and review. You can also access the reviewers' comments.

The fact that the articles are available to read immediately means that research can move forward more rapidly. And by sharing information so openly and honestly, you encourage debate. The more research takes place in the open, the easier it is to correct errors or faulty assertions. And finally, such a setup doesn't need to be expensive.

The biggest obstacle on the road to open access publishing, I think, is the traditional way we judge the quality of a researcher. We look less at the quality of the researcher's individual articles and more at the impact factors of the journals in which they are published. That's undesirable for a number of reasons. In the case of a high impact journal like *Nature*, you can only get your article published if you've made a major new discovery. But most research is incremental: you build a little on your predecessors' achievements. There has to be room for that too.

Many possibilities

I think it's a very good thing that open access is increasingly gaining priority, and that more and more new open access publishing platforms are being set up. I get the impression that it's especially young people who are more open to it, and that the older generations are more attached to the traditional model. I hope that we will eventually end up with a large-scale open research forum, with a transparent and entirely open review process. Where research is concerned, the opener it is, the better.'

2.16 Keep the book

Photo: Milo van de Pol

Irene van Renswoude (1967) is a postdoc researcher in early medieval history at the Academy's Huygens ING institute; she is affiliated with Utrecht University.

There are only a few leading journals in my field, and in the best of them you can publish only once in ten years.

'Open access publishing has a lot of advantages. Your work is easier to find, meaning that knowledge is disseminated faster. I also hope that it ensures equal opportunities for researchers, regardless of their network or the funding they have at their disposal. But that will depend on the financing models that we develop. There's a risk that open access will even promote inequality in the end.

Not many options yet

At present, there aren't many international open access journals in my field. One just got started, but I'm unfortunately not allowed to publish in it because I'm a member of the editorial board. Until recently, I was very enthusiastic about academia.edu as a way of distributing articles quickly and widely. But then I found out that I've been using it the wrong way. That kind of ignorance isn't really acceptable. As a researcher, you ought to be more familiar with the rules. It would be nice if there was a central source where you could find more information about the conditions and options for open access publishing.

The rise of new online journals has been an advantage in my own field. There are only a few leading journals, and in the best of them you can publish only once in ten years. Besides that, online journals can significantly increase the speed of publication. I'm currently often dependent on collections on a given theme, and it sometimes takes years before your article is published in one of them. By the time your research finally starts to be discussed, you've long moved on to on something else.

Like the transition to writing

Nevertheless, I'm concerned – baselessly and irrationally – that the transition from paper to digital publishing will put my rights and interests at risk. I see a clear parallel with one of my own research topics: back when people transitioned from an oral to a written tradition, there was a similar fear regarding publication. People thought "If I tell them something, then I can see what's done with my information. But if I write it down and send it out into the world, I'll lose control of it."

I remain a strong advocate of printed books. We absorb knowledge from a book differently than from a screen. Through the physical activity of reading with a pencil in my hand and making notes in the margin, I store knowledge more effectively.

In the past, we made mistakes when transitioning to a new medium. After the invention of the printing press, for example, ancient manuscripts were thrown away in the belief that they had become redundant. We now know that information was contained in those manuscripts that isn't revealed by a printed book. Let's not make the same mistake in the course of the current transition. We need to embrace the new, but keep the old.'

2.17 Peer review is not a panacea

Photo: Milette Raats

Diederik Roest (1977) is Associate Professor of String Cosmology at Groningen University and a member of The Young Academy.

I don't really see the added value of most journals.

'The discussion about open access publishing isn't really all that relevant for my day-to-day work. I hardly look at journals any more. I start each day by scanning new articles in two free online repositories. Within my relatively small field, about twenty new articles appear there every morning – that's not too much to keep up with.

Free and up to date

Those online publication repositories have several advantages over regular journals. In the first place, you have much faster access to the latest information. You don't need to wait for the time-consuming review process at a journal. Plus you also get a very quick, broad overview of what everybody is up to. The articles are entirely open access: you can read them and publish them free of charge. That means that you aren't subsidising any publishers. And if you want to read an article again, you don't have to try to remember which journal it was published in.

I don't really see the added value of most journals, but I do think the top journals play a clear role: the articles they contain have undergone rigorous selection, not only for quality but also their relevance to a wider audience. That's also convenient for me if I want a quick overview of what's going on in other fields. The role of discipline-specific journals is much less clear. Within my own field, there are maybe three journals in which you usually find solid research, whereas research published in lower-rated journals isn't always that good.

Ramshackle reviews

The only thing you would miss if you published only in open repositories is the peer review. But I think that's rarely really necessary, because good articles will rise to the top anyway. And although peer review is in itself a strong point of research, the system is certainly not a panacea. It's very time-consuming, and it's clear that reviewers don't always put their heart and soul into it. Things are sometimes approved that later turn out not to be correct. And politics plays a role too. Sometimes the only comment you get is on the lines of "interesting article, but I miss a reference to such and such". Then you know straightaway who the reviewer was.

At the moment, most of my colleagues still publish in journals, even though they've already uploaded their articles to pre-print servers. That has to do mainly with impact factors. When you apply for a job, you have to be able to present a list of peer-reviewed publications. Presenting thirty articles held in an open repository is not yet accepted. You should be able to assess the quality of a researcher in other ways – and not, incidentally, only to promote the interests of open access publishing. Those impact factors also make it difficult to compare different disciplines with one another. An article published in *Nature* or *Science* generates a gigantic impact factor. If you're working in a niche field which doesn't get into those journals as quickly, you're already miles behind.'

2.18 Self-perpetuating principle

Photo: Milette Raats

Alexander Sack (1972) is Professor of Cognitive Neuroscience at Maastricht University and a member of The Young Academy.

There may even be a situation in which I don't actually possess my own article in its published form because my university doesn't have a subscription to the relevant journal.

'Although the importance of the impact factor of journals does seem to be changing due to the current discussions of open access publishing, in practice careers still seem to depend on the impact factors of publications. That's a self-perpetuating principle. Scientific research is a competitive system. In the current funding climate, in which researchers mainly rely on indirect public funding, the competition is getting tougher. You spend your time running from one grant to another. And to get those grants, you need to publish as much as possible. I sometimes wonder whether we perhaps produce more articles now than actual knowledge.

Tax money circuit

It was only when I was appointed professor that I realised that the whole idea of publications being behind a payment barrier is rather strange. My salary is paid from tax money, as is my research. When I want to publish about it, I put a lot of time into writing the text and creating the corresponding illustrations. Quality control is dealt with by my fellow researchers during time that is usually also paid for with public money. And then I have to pay to be allowed to publish it, or they have to pay in order to read it! There may even be a situation in which I don't actually possess my own article in its published form because my university doesn't have a subscription to the relevant journal. That's bizarre!

Read and cited more

Most of my publications are still closed access, simply because the most highly regarded journals in my field still work with subscriptions. In some cases, I make an open access version myself of a closed access publication, if the journal

allows me that option. I pay the cost of that from my own professorial budget. I do that partly because of the tax money argument, but also partly from selfish motives. I want my articles to become known, and if they're openly available, then they're more likely to be read and cited.

There are already a few fully open access journals in my field, but the quality leaves something to be desired. I was on the editorial board of one of them for a while, but I resigned. The threshold for publishing was far too low. There was an inflation of articles being submitted of quite variable quality. If you want to establish new fully open access journals, you need to think hard about how you can guarantee their quality.

Cultural shift

Before we can successfully switch to other publishing models, we first need to bring about a cultural shift within scientific research itself. Instead of assessing scientists purely on the impact factor of their articles, you could, for example, take the accessibility of those articles into account. At present, the barriers are still too high for individual researchers to change the way they work. Suppose I, as an individual, were to start boycotting closed access journals – it would hurt my career. So in that way we're all helping to maintain the current situation.'

2.19 Customisation needed

Photo: Martin van Welzen

Rombert Stapel (1983) is a history postdoc at the International Institute of Social History (IISH).

Every type of publication has its own pace and readership. I think that requires other rules on open access.

'The open access procedures need to be more streamlined. That's in the interest of both researchers and their readership. At present, there's a whole jumble of rules and options. Things need to be made clearer for researchers, along the lines of: this is what we're striving for, this is how you can do it, and here's the funding to pay for it. It's now all so chaotic that I recently sat down with a publisher myself to arrange that my article would be freely accessible to everyone after an embargo period of 24 months. Negotiating was pleasant and educational, but once is enough. I think we need to negotiate that kind of agreement at a higher level, for example through the VSNU or the Academy.

Different publication cultures

But that's not so simple. Customisation is needed. In the field of history, articles have a long shelf life; their value decreases more slowly than in some of the exact sciences. In my field, it's usually only years after publication that you get the biggest spike in the number of citations. We also don't just publish articles but also collections and books. And every type of publication has its own pace and readership. I think that requires other rules on open access.

A generous publisher – of its own accord – uploaded some of my articles in collections to Google Books. That usually means leaving out a few pages, but you can read most of the work. But that's not yet standard practice. I used to work at the Fryske Akademy. A few years ago, they scanned all the books and articles and made them available online. Whether that was entirely according to the rules, I don't know.

The IISH urges its researchers to make as many publications and as much data as possible open access. But as far as I know there isn't any specific budget available to cover the publication charges. Sometimes you can cover those charges from project budgets, but if not you have to come up with a different solution.

Bigger stage

Having to pay to publish your own work seems very unnatural anyway. But I do think it's necessary for us as a wealthy country to go to some trouble in that sense. I'm now working on a big international project, and I've noticed that my southern-European and non-Western colleagues have far less access to the literature than we do. For us, it's not a problem: it only costs fifteen euros to join the National Library of the Netherlands (KB), and then you can read everything.

As a researcher, I want my work to reach the widest possible audience. The current practice of closed access keeps poorer countries from accessing your knowledge and that creates roadblocks to cooperation. As far as I'm concerned, it wouldn't hurt for the Netherlands to take the lead in changing things. By making our knowledge publicly available, we can offer Dutch research a much bigger stage.'

2.20 Make sure it's properly managed

Photo: Henk Thomas

Martin Stokhof (1950) is Professor of Linguistic Philosophy at the University of Amsterdam and a member of the Academy.

One practical problem that you rarely hear about is when third parties hold certain rights.

'For as long as I can remember, researchers in my field have simply uploaded all their articles to their own website. That's usually without the final layout of the version in the journal, but otherwise the versions are exactly the same. The time between writing an article and its actual publication on paper is simply too long – sometimes as much as a year.

In today's digital age, an article can always be found somewhere on the Internet. There are even illegal websites where you can download complete books. I think we need to acknowledge that reality. If everything is already in fact open access, then let's make sure it's properly managed.

Rights to illustrations

In my position as chairman of the European Research Council's Working Group on Open Access, I've noticed that there are major differences between the various disciplines. One practical problem that you rarely hear about is when third parties hold certain rights. Take the example of an art historian who is researching paintings. You can only use images of the paintings with the permission of the owner. Some museums subsist partly on income from publishing rights, and they won't automatically agree to your placing an image of their painting in an openly accessible document. That becomes a major problem for the researcher concerned if he or she is obliged to publish on an open access basis. The researcher then needs to find out who holds what rights and has to negotiate for open access for each individual image. That's hardly possible, certainly not in the case of a book.

Gap between rich and poor

I still think that open access has to be mandatory for it to be a success, but at the same time, we need to offer researchers the maximum possible support. Collective negotiations with publishers will help. But that brings me to another factor that's receiving too little attention: those negotiations benefit mainly our own researchers. For researchers from poorer regions, they don't solve anything. Certainly if publishing in high-impact journals costs more than in others, there's a danger that the gap between rich and poor will only get bigger.

Organisations like the Academy, NWO, and the VSNU should reject the hybrid models anyway, because they mean that you're paying the same publisher twice. They also need to support the initiatives organised by researchers. I'm thinking, for example, of the editors of the commercial journal *Lingua*, who resigned in a body last autumn and set up their own open access journal.

Finally, I think that national organisations should provide comprehensive information about practical matters such as what licences there are and which ones to select. Open access is a politically driven development whose practical implications for individual researchers can end up driving them to distraction. In the next few years we need to look together at the problems that it raises and how we can best solve them. But that open access is the way forward is perfectly clear to me.'

2.21 Be realistic: first go for green

Photo: Miletta Raats

Rens Vliegenthart (1980) is Professor of Media and Society at the University of Amsterdam and a member of The Young Academy.

Green access will be much easier and faster to arrange.

'It's great that the Netherlands has ambitions regarding open access publishing. And I'm a great believer in all articles eventually becoming open access. But I do wonder whether we aren't trying to go about it too fast. It mustn't be the case that Dutch researchers aren't allowed to publish in certain highly regarded journals because those journals don't provide options for making articles open access. That would certainly not be good for Dutch research.

Easier to achieve

As far as I'm concerned, we first need to go for "green" access. That means that all our articles will be free for anyone to read, except that you won't find them in a journal but in an online archive. That'll be much easier and faster to arrange. Many publishers already allow you to upload your articles to such an archive, although they do then often impose an unwanted embargo.

At my own university, we have the UvA-DARE repository. Its administrators are actively and increasingly seeking out University of Amsterdam publications, and they regularly approach me about adding new articles. For me as a researcher, that's a relatively low-threshold arrangement. But I don't know how many people actually retrieve articles from the repository. Perhaps we ought to organise something like that on a nationwide basis, like DANS (the Academy's institute for Data Archiving and Networked Services, ed.) does for open data. But the question then is who will pay for such an archive and manage it.

In order to be able to switch to a fully open access publishing model, all the researchers worldwide would need to reject publishers' current practices. Or we ought to publish our own journals. But I don't really see that happening – as

it is, I already don't have enough time to update my publication list on my own website.

Make knowledge accessible for policymakers

Speaking for myself, I don't expect many non-researchers to read my publications even if they are freely and publicly accessible. But I still think that everyone should be able to access them. I'm thinking, for example, of former students who work at consultancies or as policymakers, or policy advisors in government departments who want to familiarise themselves with the latest developments in my field. I also sometimes get e-mails from fellow researchers in non-Western countries such as India, Iran, and Pakistan requesting a copy of one of my articles. They just don't have enough money to pay for all those subscriptions.

At the moment, most of my own articles are closed access. I don't yet receive any research funding with an open access obligation, and I also don't have any budget from which I could pay the publication charges. So to be honest, I'm not pressing for open access right now.

However, the board of our research institute did decide recently that open access publishing should be possible for the people who want it, and we've made a small budget available. Those interested must be able to explain why specifically their article is worth the money involved.'

3. EPILOGUE

Open access publishing according to the researchers: commendable, but not always easy

'The trend towards open access is unstoppable,' says the systems geneticist Lude Franke in this booklet. And we shouldn't want to stop it, say the majority of the 21 researchers who we interviewed about open access publishing. But that doesn't mean that making publications fully accessible is always easy to achieve for every researcher.

Why open access?

Most of those interviewed find it strange – and wrong in principle – that knowledge generated with taxpayers' money is only accessible if you pay for it. Academic knowledge ought to be available for those who want it, including outside the research world. The interviewees mention specifically researchers, policymakers and professionals in the healthcare, law, and education sectors as target groups that should be able to benefit from the latest research findings.

But many of them doubt whether you can achieve that objective by means of open access publishing. The sociologist Ellen Dingemans says, for example: 'I think that we scientists need to make our knowledge more comprehensible for the public. That involves more than just making your articles available.' And the chemist Wilhelm Huck doesn't really see how open access articles will change the current state of affairs: 'My research isn't secret anyway. Anyone who wants can get a copy of my articles from me.'

A second important reason given for encouraging open access publishing is that it accelerates the advancement of science as a whole. Researchers feel that they can reach a wider audience if their articles are openly available. That was in any case the experience of the historian Ashkan Ashkpour when he made one of his articles in a closed journal openly accessible: 'As soon as my article came out from behind the payment barrier, it was clearly read and cited more widely.'

Finally, interviewees hope that the transition to open access publishing will also reduce the gap between rich and poor. 'I sometimes get e-mails from fellow researchers in non-Western countries such as India, Iran, and Pakistan,' says media researcher Rens Vliegenthart, 'requesting a copy of one of my articles. They just don't have enough money to pay for all those subscriptions.'

How should we go about it?

So although the majority of respondents endorse the ultimate objective, they don't always agree which route to take on the way to entirely open access publishing. According to the ethnologist Folgert Karsdorp, 'imposing obligations is the only way to get things moving'. But the educationalist Marinus van IJzendoorn counters: 'that a funding agency like NWO is now requiring researchers to publish open access is harmful, especially for the impact and reputation of young researchers'. PhD candidate Ashkan Ashkpour says that 'a researcher who is just starting out can't risk opting for an open access journal that doesn't have an established reputation.' That's why, like the majority of the researchers interviewed, he still publishes in the mostly closed top journals in his field. Incidentally, a number of respondents say that they subsequently make those closed publications openly available by paying what is often a considerable sum of money.

Publication charges

Many interviewees see those publication charges as a major obstacle to more open access publishing. A number of them say, for example, that they don't currently have any budget to pay the often high charges. The linguistic philosopher Martin Stokhof says that those charges also create undesirable barriers for researchers in less wealthy groups or countries: 'Certainly if publishing in high-impact journals costs more than in others, there's a danger that the gap between rich and poor will only get bigger.'
Some researchers express objections in principle to publication charges. The neuroscientist Alexander Sack explains the twist in the system as follows:

'My salary is paid from tax money, as is my research. When I want to publish about it, I put a lot of time into writing the text and creating the corresponding illustrations. Quality control is dealt with by my fellow researchers during time that is usually also paid for with public money. And then I have to pay to be allowed to publish it!' Wilhelm Huck is even adamantly opposed: 'If I myself have to pay to publish an article, it feels like I'm placing an advert. The current situation also makes things worse for the taxpayer. He or she now pays double: for subscriptions for universities and for the publication charges to make articles openly accessible. So ultimately we collectively spend more on all the publication charges than on the subscriptions that we currently pay.'

The oncologist Hanneke van Laarhoven says that she comes up against a practical problem: 'My main research funding body obliges me to make the resulting publications openly accessible, but I'm not allowed to include the associated charges in my budget.' And as the health psychologist Andrea Evers illustrates with an anecdote, if there is a budget, unexpected situations may still arise: 'I recently finished off a VIDI project. There are a lot of publications at the end of a project like that. But the project budget has been finalised, meaning that I can no longer claim the publication charges that have to be paid.' And even if there is a budget, researchers may not be aware of it, as Ashkan Ashkpour reports from his own experience.

Practical obstacles

In addition to publication charges, researchers say that there are currently a number of other obstacles to open access publication. As Janneke Gerards explains about the field of law, there are some disciplines with few or no open access initiatives. Andrea Evers explains that there is a lack of standardisation, meaning that you have to find out what the requirements are for each separate journal. Given his own experience, the historian Rombert Stapel says that negotiating with a publisher takes up too much time for individual researchers: 'Negotiating was pleasant and educational, but once is enough.' And because negotiations on the accessibility of his still unwritten book took more than a year, Folgert Karsdorp's appointment has ended and he will have to write the book in the evenings, while he works in his new job.

Martin Stokhof notes that some researchers also have to deal with legal obstacles because they do not themselves own all of the content in their publication: 'Take the example of an art historian who is researching paintings. You can only use pictures of the paintings with the permission of the owner. If the publication has to be open access, the researcher then needs to find out who holds what

rights and has to negotiate for open access for each individual image. That's hardly possible, certainly not in the case of a book.'

Another practical problem, says Janneke Gerards, confronts research assistants who get their PhD by writing a monograph: if such a dissertation can already be downloaded from the university's website free of charge, no publisher will still want to bring it out as a printed book.

Advent of new journals

A large number of new open access journals are currently coming on the research scene. Some researchers find that a good thing, but others find it hard to see the wood for the trees: 'As far as I'm concerned, we don't need publishers,' says the language technologist Antal van den Bosch. 'If we want to, we can start up our own journals just fine. We've already had the digital revolution and you no longer need much in the way of staff.' 'I think that the new journals offer new opportunities for researchers from developing countries,' says the aquatic ecologist Jan Kuiper. 'Prestigious journals often receive so many articles that they can select only the best ones. That's very nice, but it also creates a barrier for researchers who need to carry out their research with less sophisticated equipment.' For the time being the historian Irene van Renswoude sees mainly positive aspects: 'The rise of new online journals has been an advantage in my own field. There are only a few leading journals, and in the best of them you can publish only once in ten years.'

At the same time, it is becoming increasingly harder to keep track of all the journals, says Marinus van IJzendoorn, who in just a few weeks received invitations from 88 new journals. 'It's totally unclear to young researchers what the quality of the various journals is. Publication lists are becoming increasingly meaningless. For example, I recently received a job application from someone whose list of publications consisted entirely of unknown titles. I had to spend extra time finding out whether those articles actually amounted to anything.'

Online archives

If publishing in an open access (or hybrid) journal is not possible, an alternative to this 'golden' access route is the 'green' access option, i.e. making a version of your article available via an online repository. But disciplines differ enormously in that respect. Physicists, mathematicians, and computer scientists have been working for years with the arXiv.org repository, which is hosted by an American university. It works just fine, say those involved, although everyone uses it

differently. The string theory expert Diederik Roest says that he hardly reads professional journals anymore, and starts each day by checking out new articles on two of these repositories. 'You don't need to wait for the time-consuming review process at a journal. And if you want to read an article again, you don't have to try to remember which journal it was published in.' The mathematician Johan van Leeuwaarden thinks that arXiv.org is an excellent invention, but he comments: 'We shouldn't romanticise arXiv.org. It's an archive, a database where you can store and trace articles. But it's also no more than that. It isn't edited and there's no peer review process.' The nanotechnologist Alexander Brinkman agrees: 'A repository like arXiv.org will never be able to replace the traditional journals. Basically, anyone can post anything they like in an online environment like this, which means that you don't have a filter to separate good work from bad.' The computer scientist Jan Bergstra views the latter precisely as an advantage: 'Peer review filtering still plays too big a role at the journals, and there's hardly any room for research that may not be absolutely top class but is still good solid work.'

A similar archive was recently set up for the life sciences (bioRxiv.org), and good use is being made of it, says Lude Franke: 'In my field, speed is of the essence because competitors are lying in wait. An archive like bioRxiv.org allows you to post something as soon as you've discovered it. Conversely, it enables you to keep up with what those competitors are doing so you're not just duplicating their work.' Elizabeth Moloney would like to go even a step further and calls for a completely open research forum, where the whole scientific publishing process would be open and transparent: 'Some new publication platforms are increasingly getting "wiki"-like in their setup. Articles are immediately online and open to discussion and review. You can also access the reviewers' comments. The fact that the articles are available to read immediately means that research can move forward more rapidly. And by sharing information so openly and honestly, you encourage debate.'

Janneke Gerards, however, points out the risks if you rely on this kind of international online archives: 'For articles in English there are now online archives where you can post unpublished versions of your articles, such as the Social Science Research Network (SSRN). But there are almost no open access options for Dutch-language articles about Dutch law. At this point, mandatory open access would discourage researchers from publishing about Dutch law.'

Different methods of assessment

For many researchers, there is a clear connection between the feasibility of open access publishing and the way researchers are assessed. In most disciplines, it's the impact factor of the journals in which someone publishes rather than the quality of their articles that determines the further course of their scientific career. And the impact factor is still often highest for traditional, mostly closed, journals. The majority of those interviewed say that quality needs to be assessed differently. What one should do is look at the number of actual citations, take the social impact into account, or also consider the percentage of open access articles. That would release the individual researchers from the stranglehold of the closed journals.

Publication cultures

One message that most researchers convey, either implicitly or explicitly, is that policymakers must allow for the difference in publication cultures in different disciplines. Articles and books in the social sciences and humanities generally have a much longer shelf life than in the exact sciences. In some branches of science such as language technology and computer science, open access has already been the norm for a long time, whereas in the field of law the discussion has only just begun. How important various types of publications are also differs from one discipline to another. For a physicist, an article in *Nature* or *Science* is the Holy Grail, whereas an historian wants to have a monograph on his or her list of publications. And for a computer scientist, a technical report or a reference guide is probably even more important. As Rombert Stapel puts it: 'Every type of publication has its own pace and readership. I think that requires other rules on open access.'

Information, information, information

What many of those interviewed say they need at the moment is better information and support in practical matters. They are looking for answers to such questions as: Where and how can I publish by means of open access? Which new journals are any good and which aren't? Which publishers offer what deals, and what does that actually mean for me? If I have to pay, what budgets can I request funding from, and how long will that take? They also say that they need a central source where they can find out about new initiatives in the field of scientific publishing, and get support regarding the legal issues involved in contracts.

Although many researchers certainly support open access publishing, they think that it is taking too much time and effort in the current transition phase. Some of them also feel that the position of the Netherlands as a frontrunner in this field means that Dutch researchers run the risk of falling behind their international competitors. A number of researchers have therefore decided to ignore it. Their idea is 'Open access publishing will eventually become the norm. And it should be. But as long as I don't have to publish that way myself, I'm not going to spend a lot of time on it that I could otherwise devote to my research.'

4. BACKGROUND INFORMATION

Glossary

In the open access world, a given term may have a number of different meanings. So as to create a shared context for the interviews, we drew up a list of terms. An interpretation of each term was then selected on the basis of frequently used sources. The interviewees received a copy of the list prior to the interviews.

- **open access**:[2] unrestricted access to digital information, free of charge. Unrestricted access means, among other things, that anyone can do anything they wish with the information, such as take over some or all of it, publish it, use it freely in teaching/research, etc. Some authors[3] distinguish between '*gratis* open access' (i.e. free of charge) and '*libre* open access' (i.e. free of charge and with unrestricted access). For the purpose of the interviews, we assumed that we were concerned with '*libre*'.
- **closed access**: publications that are only accessible for someone who has a subscription, or someone who works at an institution that has a subscription;
- **publications**: research results, for example articles, books, dissertations, or reports;
- **embargo period**: a period, set by the publisher and counting from the date of publication, during which the publication concerned may not be published by means of open access publication;

2 Summary of the Berlin Declaration, http://openaccess.mpg.de/Berlin-Declaration. This implies, among other things, that publications may be re-used free of charge and that the copyright is not transferred to a publisher.

3 Peter Suber, https://dash.harvard.edu/bitstream/handle/1/4322580/suber_oagratis.html.

- **article processing charge**: the amount paid to publish a publication by means of open access;
- **green open access**:[4] open access to a publication by including it in an online repository, and making it freely accessible there;
- **gold open access**:[4] open access provided by a publisher[5] (always without an embargo period);
- **hybrid open access**: open access in a closed access journal;
- **publisher's version of a publication**: version as published by the publisher;
- **final author's version or post-print of a publication**:[6] version of a manuscript approved by a journal after peer review and before formatting or post-editing by a publisher;
- **pre-print of a publication**:[6] first version of a manuscript submitted to a journal, prior to peer review.

Open access in the case of research funding bodies and the Academy

The main research funding bodies in the Netherlands are Horizon2020, the Ministry of Education, Culture and Science, and NWO. Their policy on open access (and that of the Academy) is given below (situation as of January 2016). The policy of the Dutch universities is available on the Dutch open access website.[7]

- **Horizon2020**:[8] all peer-reviewed scientific publications are open access, by means of either gold or green open access. In the case of green open access, a six-month embargo period applies, except for the humanities and social sciences, for which a period of twelve months applies.
- **Ministry of Education, Culture and Science**:[9] By 2019, 60% of all Dutch scientific publications are intended to be available by means of gold open access, rising to 100% by 2024.

4 Peter Suber, http://legacy.earlham.edu/~peters/fos/overview.htm.

5 Incidentally: some publishers call a publication "gold OA" if it can be read on the publisher's website, whereas the publication may not be included on an OA basis in a repository or the publisher requires that the copyright be transferred to the publisher. This is not OA according to the Berlin Declaration.

6 Stevan Harnad, Electronic Preprints and Postprints, http://cogprints.org/3019.

7 http://openaccess.nl/nl/in-nederland/wat-wil-de-wetenschap-0.

8 From http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/amga/h2020-amga_en.pdf, p. 216 et seq.

9 Letter from the State Secretary of Education, Culture and Science to the Lower House of the Dutch Parliament, November 2013, https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/kamerstukken/2013/11/15/kamerbrief-over-open-access-van-publicaties/open-access-1.pdf.

- **NWO**:[10] all publications generated by NWO-funded research are open access, by means of either gold or green open access. In the case of green open access, no embargo period is permitted and publications must be accessible immediately.
- **Academy institutes**[11] all publications are open access, by means of either gold or green open access. In the case of green open access, a six-month embargo period applies, except for the humanities and social sciences, for which a period of twelve months applies. All Academy publications are uploaded to the Academy's repository.

Open access in the case of publishers

Most publishers offer the possibility of publishing on an open access basis in their closed access journals. Some of them also have open access journals. There are also some publishers whose journals are exclusively open access.

A survey[12] shows that the average article processing charge for a hybrid journal is often substantially higher than for an open access journal (according to the authors, in the UK it was an average of GBP 1800 in 2010-2014 as opposed to GBP 1200).

Dutch universities (and the Academy) often conclude contracts with closed access publishers concerning publication in a large number of journals. When these contracts terminate, the negotiators (the VSNU, the UKB – a consortium of the Dutch university libraries and the National Library of the Netherlands – and SURFmarket) attempt to include open access provisions in some way. The situation regarding closed access publishers was as follows (end of December 2015).[13]

- **Elsevier** (2016 onward): currently being negotiated; agreement in principle reached on open access.
- **SAGE** (2015 to 2016): from 2016 a total of 200 articles open access without charge (about 20% of Dutch output); for other articles, the article processing charge has been reduced (GBP 200 instead of GBP 1600).
- **Springer** (2015 to 2016): open access without charge in all Springer hybrid journals (not in open access, *Nature* or *BioMed Central* journals).

10 http://www.nwo.nl/beleid/open+science.
11 http://www.knaw.nl/openaccess.
12 Stephen Pinfield, Jennifer Salter, and Peter A. Bath, The 'Total Cost of Publication' in a Hybrid Open-Access Environment: Institutional Approaches to Funding Journal Article-Processing Charges in Combination, 2015, https://dx.doi.org/10.1002/asi.23446.
13 http://www.vsnu.nl/faq-open-access-nl.html (status 23 Dec. 2015).

- **Wiley** (2016 onward): currently being negotiated; agreement in principle reached on open access.
- **Other closed access publishers**: no open access, or negotiations on open access ongoing or still need to begin.

PLOS[14] (Public Library of Science) is an example of a non-profit open access publisher. BioMed Central[15] is an example of a commercial open access publisher (parent company is Springer).

Websites

- Directory of Open Access Journals (DOAJ), https://doaj.org: list of high-quality, peer-reviewed open access journals.
- Directory of Open Access Books (DOAB), http://www.doabooks.org: list of peer-reviewed academic open access books, including to increase traceability of open access books.
- Beall's List of Publishers, http://scholarlyoa.com/publishers: list of 'potential, possible, or probable predatory scholarly publishers'.
- RoMEO, http://www.sherpa.ac.uk/romeo: list explaining policies of publishers regarding inclusion of publications in a repository.
- Dutch open access website, http://www.openaccess.nl.

14 https://www.plos.org.
15 https://www.biomedcentral.com.

5. THE VOICE OF SCIENCE AND SCHOLARSHIP

The following persons were interviewed for this booklet:

Ashkan Ashkpour, Social history PhD candidate, IISH
Jan Bergstra, Professor of Theoretical Informatics, University of Amsterdam, Member of Academy
Antal van den Bosch, Professor of Language and Speech Technology, Radboud University Nijmegen, Member of Academy
Alexander Brinkman, Professor of Quantum Transport in Matter, University of Twente, Member of Young Academy
Ellen Dingemans, Postdoc sociology researcher, NIDI
Andrea Evers, Professor of Health Psychology, Leiden University, Member of Young Academy
Lude Franke, Associate Professor of Systems Genetics, Groningen University Medical Centre
Janneke Gerards, Professor of European Law, Radboud University Nijmegen, Member of Academy
Wilhelm Huck, Professor of Physical-Organic Chemistry, Radboud University Nijmegen, Member of Academy
Marinus van IJzendoorn, Professor of Education and Child Studies, Leiden University and Erasmus University Rotterdam, Member of Academy
Folgert Karsdorp, Ethnology PhD candidate, Academy's Meertens Institute
Jan Pieter, Aquatic ecology PhD candidate, NIOO
Hanneke van Laarhoven, Professor of Translational Medical Oncology, Academic Medical Centre Amsterdam, Member of Young Academy
Johan van Leeuwaarden, Professor of Mathematics, Eindhoven University of Technology, Member of Young Academy

Elizabeth Moloney, Postdoc researcher in neurosciences, NIN, now McLean Hospital, Boston, Massachusetts,
Irene van Renswoude, Postdoc researcher in early medieval history, Huygens ING
Diederik Roest, Associate Professor of String Cosmology, University of Groningen, Member of Young Academy
Alexander Sack, Professor of Cognitive Neuroscience, Maastricht University, Member of Young Academy
Rombert Stapel, Postdoc history researcher, IISH
Martin Stokhof, Professor of Linguistic Philosophy, University of Amsterdam, Member of Academy
Rens Vliegenthart, Professor of Media and Society, University of Amsterdam, Member of Young Academy

About the Academy

The Royal Netherlands Academy of Arts and Sciences was founded in 1808 as an advisory body to the Dutch Government – a role that it continues to play today. The Academy derives its authority from the quality of its members, who represent the full spectrum of scientific and scholarly endeavour and are selected on the basis of their achievements. It is also responsible for fifteen internationally renowned institutes whose research and collections put them in the vanguard of Dutch science and scholarship.

The Academy is the forum, voice, and conscience of science and scholarship in the Netherlands. Its institutes carry out research and manage collections regarded as top-ranking both in the Netherlands and abroad. Its activities are based on the conviction that knowledge and creativity are vital to wellbeing and prosperity.

As an independent entity, the Academy brings together human and other resources in order to make an informed and creative contribution to the advancement of society. It aims to be the source of inspirational, innovative insights, prospects and alliances. It promotes the quality and integrity of research. It wants its institutes to stand for excellence and to attract talented researchers.

Academy, learned society

Since its inception, the Academy has been a learned society of outstanding Dutch scientists and scholars. Membership is awarded on the basis of scientific and

scholarly achievement. Members are appointed for life. Starting in May 2011, the Academy has appointed a maximum of sixteen new members every year. Nominations may be submitted by members and non-members. Assessments by external referees are now also taken into account. In the Netherlands, Academy membership is regarded as a major accolade for a person's scientific or scholarly career. The Academy has ordinary members and foreign members.

Academy members represent a wide spectrum of scientific and scholarly disciplines. The society therefore gives expression to both the unity and diversity of science and scholarship.

The Young Academy, platform for young scientists and scholars

The Young Academy is a platform for outstanding young scientists and scholars in various disciplines. It organises inspiring activities focusing on interdisciplinarity, science policy, and the interface between science and society. The Young Academy has fifty members. All are between 25 and 45 years of age and received their doctorates less than ten years before their appointment to the Academy. They work at Dutch universities and research institutes.

The Young Academy is developing a broad spectrum of activities, ranging from media appearances to educational events, and from advisory reports to meetings and theatrical performances. In the years ahead, it will focus on the following key themes: the precarious position of young scientists in the job market; diversity; the position of the (minor) humanities and theoretical natural sciences; and European science policy.

PhD candidate, postdoc

- PhD candidates have a temporary appointment at a university where they carry out independent research under the supervision of an experienced researcher, generally for a period of four years. PhD candidates must have completed a master's degree. Their research results are incorporated into a dissertation, which must be defended before a doctorate committee.
- Postdocs are generally researchers who have recently gained their doctorate and who go on to carry out independent research of the basis of a temporary contract (ranging from one to five years) at a university or research institute. PhD candidates receive considerable supervision, whereas a postdoc has greater independence and responsibility for his/her research and for acquiring the necessary funds.