

Inter-Research: Changing Tack in the Plan-S Open Access World

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Abstract

For over 40 years, Inter-Research (IR) has been a small, family-owned publisher, well-respected for its high-quality science journals. IR commits the majority of its income to a rigorous peer review process, intensive in-house copy- and sub-editing, and attention to clarity of presentation in typography and layout. It currently publishes 8 titles—4 Hybrids and 4 Fully Open Access, of which 5 titles directly relate to the Aquatic Sciences. By far dominant among these is the flagship journal *Marine Ecology Progress Series*. While IR embraces change (e.g. online publication was introduced in 2000 and open (or free) access (OA) publication in 2005), the focus on traditional production quality means the journals have remained a comfortable and unchanging constant over the decades. IR's founder, Prof. Dr. Otto Kinne, believed strongly in making scientific research widely accessible. However, the cautious program of transforming the subscription journals towards Fully OA publications that began in 2013 was suspended in 2015 when article submissions to the journal *Aquatic Biology* immediately, significantly and unexpectedly dropped almost immediately on "OA flipping", a clear signal that globally financial support for the OA publication model was not matching the hype promoting its benefits and the degree to which it was desired. European funder-based "Plan S", integrated into European Commission policy and initiated in 2020, promises to provide OA funding and forces European academic publishers to transform to Fully OA publication by end of 2024. In addition to introducing IR, its products, its products and its publication philosophy, this "Vendor Demonstration" describes how one small and not greatly resourced publisher (compared to the big conglomerates) is cautiously changing tack in the Plan S–Covid-19 world. IR's journey to Fully OA publication faces many challenges and uncertainties, but also great expectations.

Keywords: Inter-Research Science Publisher; Plan S; Science--Periodicals—Publishing; Open access publishing; Science publishing.

1. 1979–1999: Fair Winds and Following Seas

When the fourth volume of the five-volume book series *Marine Ecology: A Comprehensive Treatise on Life in Oceans and Coastal Waters*¹ was published in 1978, the first volume was already eight years old. The series was the first attempt to concisely bring together all knowledge of marine ecology. The work was planned, collated and edited by the outstanding marine ecologist, Otto Kinne (1923–2015), who also contributed about one-quarter of its content². From his vantage point surveying the rapid advancements in marine ecology research over the 1970s, Kinne approached Wiley with the suggestion of a companion journal: *Marine Ecology – Progress Series*, to keep the treatise current. Kinne, author of over

¹ Kinne (1970–1984). PDFs of the entire series can be freely downloaded from www.int-res.com/book-series/marine-ecology-books/

² Smetacek (2015).

100 research papers³, initiator of the European Symposium on Marine Biology (EMBS)⁴, long-standing Director of the Biologische Anstalt Helgoland (BAH)⁵, founder and Editor-in-Chief of the journal *Marine Biology* (Springer), was no novice to academic publishing. However, Wiley turned down the proposal⁶. Not one to accept defeat, Kinne founded the publishing company Inter-Research (IR)⁷, with an initial staff of 3 including himself as Editor-in-Chief, based at his home in Hamburg (Germany). It launched with the first issue of *Marine Ecology – Progress Series* (MEPS)⁸ on July 31, 1979, containing 13 articles. The journal quickly attracted much attention, growing at the rate of one extra volume per year⁹. Kinne followed the *Marine Ecology* treatise with a four-volume series *Diseases of Marine Animals*¹⁰. Following pattern, in 1985 he founded a second supporting journal, *Diseases of Aquatic Organisms* (DAO)¹¹.

The success of MEPS¹², however, forced a change of vision on its creator. “[MEPS] grew in a direction that differed from the original plan (...) a new scientific journal behaves somewhat similarly to a human baby (...) as the baby grows up it begins to unfold its own preferences¹³.” Kinne took early retirement¹⁴ from the BAH in 1984, after 22 years as its Director, and settled on a country property on the outskirts of the small village of Oldendorf (Luhe), near the beautiful medieval city of Lüneburg. There he embarked on the “second part of [his] professional life achievement”¹⁵, establishing, driving and expanding the publishing activities of Inter-Research, all located in Oldendorf.

Within academia, awareness was dawning that during the 1960s and 1970s the control of academic publishing¹⁶ had been unwittingly handed over to big, profit-oriented publishers¹⁷. Technically a commercial publisher, Kinne structured and presented IR in the traditional Learned Society publication model: scientific credibility from a scientific institute in the background whose membership consisted of outstanding ecologists; close international cooperation “across all major cultural nations;” a large editorial board; close and enthusiastic interaction between editors and referees; high review and production standards—all managed or performed in-house under the direct oversight of an undisputed scientific giant (i.e. Kinne)—and most importantly, “spending a significant part of its income on promoting research” (as opposed to lining the pockets of investors and directors not connected to academia)¹⁸. Here he was referring not only to the publishing activities, but also the establishment in 1984 of a new institute, the International Ecology Institute (ECI). The main vehicles for its aims¹⁹ are the annual (from 2019, biennial) ECI and International Recognition of Professional Excellence (IRPE) Prizes²⁰ awarded to scientists for outstanding and

³ A comprehensive list can be found at www.int-res.com/about-ir/irs-founder-otto-kinne/list-of-scientific-publications/

⁴ www.marinestations.org/embs-european-marine-biology-symposium

⁵ See Wiltshire (2017).

⁶ Smetacek (2015).

⁷ Still in Kinne family ownership, registered as an e.K. (i.e. sole proprietorship) in the Handelsregister of the Amtsgericht Lüneburg.

⁸ The dash in the MEPS title was dropped from Vol. 50 (1988) onwards.

⁹ This can be seen on the MEPS homepage www.int-res.com/journals/meps/meps-home. Initial growth rate was one volume per year to 16 volumes in 2006. After 1996, the growth rate of MEPS slowed but continued to a maximum of 25 volumes annually (2007) followed by some fluctuations before settling into the present 23 volumes.

¹⁰ Kinne (1980–1990). PDFs of the whole series can be freely downloaded from www.int-res.com/book-series/diseases-of-marine-animals-books

¹¹ <https://www.int-res.com/journals/dao/dao-home/>

¹² Kinne took evident pride in reporting (Kinne, 1985) that MEPS had within 10 years achieved status as the world’s no. 1 in marine ecological journal publication based on Garfield (1987) and Fuseler-McDowell (1989, 1990) (note the latter are IAMSLIC conference papers!), and unspecified questionnaires and letters addressed to the Editor.

¹³ Kinne (2005a, p. 1).

¹⁴ He had severe hearing difficulty through physical damage to his ears as a youth and this condition was worsening (Smetacek, 2015).

¹⁵ Kinne (2005a, p. 2).

¹⁶ With university presses, the aim was to shed non-core research and teaching functions to cut costs.

¹⁷ The beginnings of the so-called “serials crisis”. For a definition of that, see e.g., Panitch & Michalak (2005).

¹⁸ Kinne (1988a, p. 1) and many other Editorials penned by Kinne, see <https://www.int-res.com/journals/editorials/>

¹⁹ For its aims, see <https://www.int-res.com/ecology-institute/eci-home/>

²⁰ ECI prize: see <https://www.int-res.com/ecology-institute/eci-prize/>, IRPE Prize: see <https://www.int-res.com/ecology-institute/irpe-prize/>

sustained achievements in marine, freshwater and terrestrial ecology research, in rotation. The ECI Prize comes with the “attached string”²¹ of writing a book for the *Excellence in Ecology* book series²². Apart from the philanthropic work²³ nearly all income generated by IR is returned back into the publishing activities. The ECI had another important role in providing a separation between Kinne’s activities as Editor-in-Chief (Kinne and in-house Assistant Editors-in-Chief and Production Editors were formerly listed in the journals as affiliated to the ECI)²⁴ and Kinne’s activities as publisher and owner of IR.

Over the years six more journal titles were added to MEPS and DAO: *Climate Research* (CR; founded 1990), *Aquatic Microbial Ecology* (AME; founded 1995)²⁵, *Ethics in Science & Environmental Politics* (ESEP; founded 2000)²⁶, *Endangered Species Research* (ESR; founded 2004)²⁷, *Aquatic Biology* (AB; founded 2007)²⁸; and *Aquaculture Environment Interactions* (AEI; founded 2009)²⁹. Fig. 1 provides a summary of vital statistics for each title as of October 2020. A ninth journal, *Sexuality and Early Development in Aquatic Organisms* (SEDAO; founded 2012)³⁰ was absorbed into AB in 2016. None of the journals established after MEPS reached its growth or output; taken together they equal approximately three-fifths of the publishing output of MEPS, which is clearly the IR flagship³¹.

²¹ As described by the first winner, Fenchel (1987, p. xix).

²² To date (2021), there have been 34 ECI Prizes and 25 IRPE Prizes awarded, and 23 volumes of the *Excellence in Ecology* book series (published by the ECI but produced by IR).

²³ In addition to the ECI, see also the Otto Kinne Foundation <https://www.int-res.com/ecology-institute/okf/>

²⁴ Nonetheless a totally transparent one since the street addresses of the ECI and IR were identical. Now that all the journal Editors-in-Chief are external to IR, affiliation to the ECI is no longer used. The position of Managing Editor is an administrative role within the publishing company.

²⁵ Labelled as a companion journal to MEPS, AME is the continuation of the journal *Marine Microbial Foodwebs* originally published by the Institut Océanographique, Fondation Albert 1er Prince de Monaco, Paris.

²⁶ Originally conceived as a forum to discuss the ethical concepts of the (now defunct) Ecoethics International Union (EEIU), also founded by Kinne.

²⁷ Endangered species became a new focus for Kinne, due to his discovery of the extremely rare fire-bellied toad *Bombina bombina* on his property in Oldendorf and his attempts to establish there a breeding centre to aid species recovery.

²⁸ To give an alternative outlet for the increasing number of articles pre-rejected by MEPS for being out-of-scope as too biological and not ecological.

²⁹ Kinne was persuaded by T. Dempster and M. Holmer to establish the journal.

³⁰ Kinne was persuaded by T. J. Pandian, a distinguished scientist and former PhD student of Kinne’s, to establish the journal. There were several reasons for its lack of success, but mainly that its subject niche was too specialised and small. Some researchers later informed IR they had assumed from the title that the journal was spurious.

³¹ Output in terms of total articles published annually across all journals peaked at 1,111 in 2012, i.e. 88 articles in 1980 (first full year of operation); 1,111 articles in 2012; and 706 articles in 2020 (compiled from counting in publications or IR internal production databases).

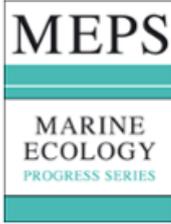
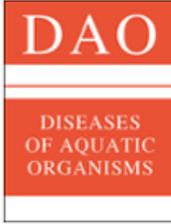
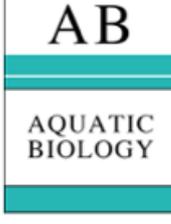
 <p>MEPS MARINE ECOLOGY PROGRESS SERIES</p>	<p>Founded: 1979 Hybrid Frequency: 23 Vols / Yr Fortnightly Cycle Article Acceptance Rate: 49% Paid OA (2017–2019): 17.5% Impact Factor: 2.326</p>	 <p>DAO DISEASES OF AQUATIC ORGANISMS</p>	<p>Founded: 1984 Hybrid Frequency: 5 Vols / Yr Pub-As-Go Fortnightly Cycle Article Acceptance Rate: 48% Paid OA (2017–2019): 11.9% Impact Factor: 1.368</p>
 <p>CR CLIMATE RESEARCH</p>	<p>Founded: 1990 Hybrid Frequency: 3 Vols / Yr Pub-As-Go Fortnightly Cycle Article Acceptance Rate: 24% Paid OA (2017–2019): 24.2% Impact Factor: 2.023</p>	 <p>AME AQUATIC MICROBIAL ECOLOGY</p>	<p>Founded: 1995 (1985) Hybrid Frequency: 2 Vols / Yr Pub-As-Go Fortnightly Cycle Article Acceptance Rate: 34% Paid OA (2017–2019): 24.2% Impact Factor: 1.841</p>
 <p>ESEP ETHICS IN SCIENCE AND ENVIRONMENTAL POLITICS</p>	<p>Founded: 2000 Fully OA (no APC charges) Frequency: 1 Vol / Yr Pub-As-Go Fortnightly Cycle Article Acceptance Rate: 21% Impact Factor: Not assigned</p>	 <p>ESR ENDANGERED SPECIES RESEARCH</p>	<p>Founded: 2004 Fully OA Frequency: 3 Vols / Yr Pub-as-Go Fortnightly Cycle Article Acceptance Rate: 58% Impact Factor: 2.258</p>
 <p>AB AQUATIC BIOLOGY</p>	<p>Founded: 2007 Fully OA Frequency: 1 Vol / Yr Pub-as-Go Fortnightly Cycle Article Acceptance Rate: 44% Impact Factor: 1.588</p>	 <p>AEI AQUACULTURE ENVIRONMENT INTERACTIONS</p>	<p>Founded: 2009 Fully OA Frequency: 1 Vol / Yr Pub-as-Go Fortnightly Cycle Article Acceptance Rate: 47% Impact Factor: 1.704</p>

Fig. 1. Foundation year, publication model, publication frequency and cycle, article acceptance rates and impact factors for each of the Inter Research (IR) journals, October 2020. APC: Article Processing Charge; OA: Open Access.

The growth in publishing output needed a parallel growth in staff and facilities. Kinne purchased houses in the quiet residential cul-de-sac bordering his property to provide offices for IR activities. Along with his wife Helga Kinne the original staff of three expanded to Assistant Editors-in-Chief, Production Editors, Managing Editors, Production Managers and “Assistants to the Editors”—the latter comprise clerks that help with the logistics of the review process, administrative and financial clerks, secretaries, copy- and sub-editors, typesetters / graphic designers, and IT specialists. In 2005 Kinne calculated the total number of persons associated with IR to be 3,793³², today (2021) it is nearly 27,000^{33,34}. Kinne was intensely proud that almost the entire publication process was managed or carried out either by staff directly employed or under freelance directly to IR³⁵. Only printing and some software management systems are in the hands of third parties.

³² Kinne (2005a).

³³ Counts from IR internal databases. Consider the effort cost alone needed to maintain the oversight, relevancy and currency of ca. 27,000 worldwide contacts and subject specialties of highly mobile scientists.

³⁴ 2020/2021 Covid-19 pandemic effects aside, 22 permanent staff based in Oldendorf (not all full-time and as in most small businesses, many have multiple roles) with an additional 9 freelancers directly contracted by IR. Outside IR on the editorial and peer review side, there are 14 Editors-in-Chief, 211 Contributing Editors, 353 Review Editors, and 26,188 peer reviewers.

³⁵ See e.g. Kinne (2005a).

IR's rapid growth in the late 20th Century can be attributed to Otto Kinne's immense stature as a scientist and editor, his insistence on rigorous but fair peer review and high-quality sub-editing and production standards, the burgeoning research in marine ecology within the relatively small market of marine ecology journals³⁶, and its establishment at the height of the "golden era" of commercial academic publishing before the serious effects of the "serials crisis" set in³⁷.

2. 2000–2019: Variable Winds and Increasing Seas

The 21st Century opened with two developing tools that Academia would wield to combat the serials crisis: technology that allowed do-it-yourself document production and instantaneous global distribution³⁸ and a new, reader-friendly publication model, Open Access³⁹, both of which brought challenges and change to the traditional academic research publication model on which IR was built.

In a 1988 keynote address Kinne observed: "Authors are interested in maximum dissemination of their work; editors, in maximizing quality; publishers, in maximizing income; users, in maximizing access to information. The problems of coordinating and harmonizing such conflicting interests are considerable (...)⁴⁰." Few had better direct experience of these problems: as an established researcher and author Kinne understood the drive for maximum dissemination and maximum access; as an editor (and researcher) he was passionate about maximising the quality of research; as a publisher he needed to secure the survival of his business. Where he (and thus IR) stood with regards to individual 21st Century forces and changes in academic publishing was greatly influenced by the balancing act among these interests.

Kinne the researcher welcomed the Internet for maximising dissemination and access⁴¹, particularly for *informal* communications between scientists, but as an editor he was greatly concerned at potential threats to the quality and established rigor of formal scientific research publication. In a remarkably perceptive Editorial⁴² he outlined what he saw to be the risks in electronic publishing, which can be summarised as pressure, speed, quantity and muddiness versus the benefits of the established system: composure, digestion, quality and clarity⁴³. Thus, he remained an advocate of the traditional, centuries-proven model of editor-moderated peer-review and publication in established journals⁴⁴. Possibly from his experience battling German bureaucrats when Director of the BAH⁴⁵, he was strongly against political or lobbyist intervention in science⁴⁶. It would have been interesting to read his

³⁶ For standards and position see Garfield (1987), Kinne (1988a), Fuseler-McDowell (1989, 1990).

³⁷ For a definition / explanation of the "serials crisis", see Panitch & Michalak (2005).

³⁸ That is, ubiquitous word processing software and the Internet, which weakened the industrial monopoly of publishers, booksellers and their distribution networks.

³⁹ I've assumed this readership does not need the Open Access publication model explained, otherwise see e.g. Suber (2009).

⁴⁰ Kinne (1988b, p. 278).

⁴¹ MEPS Volume 201 (August 9, 2000) was the first published online, pre-announced in Kinne (2000), though IR already had a heavily visited (for that time) website—Kinne reports 180,000 to 250,000 visits per month.

⁴² Kinne (1999)

⁴³ "The scientific process will be damaged where quality submits to quantity, where speed overrules exactness and performance. Computers are not only great in producing progress, they are also great in producing trash (...) The scientific process abounds with risks of becoming blurred and distorted: neglect of copyright, intellectual property, scientific correctness and honesty; falsification of priority claims; concealed plagiarism or downright stealing of foreign findings and ideas; inappropriate application of scientific techniques and statistical methods; misquotations and misinterpretations of the works of peers; misspellings and misuse of scientific names and of taxonomic rules. In an overall scenario of increasing competition for jobs and professional standing, the pressure to publish and to perform grows, and with it grow numerous temptations. These offer themselves, more conveniently than anywhere else, in insufficiently controlled electronic publishing." (Kinne, 1999, p. 4)

⁴⁴ Presenting the ingenuous ecological argument: "[Views that the network will be the ultimate equalizer for dismantling hierarchy] are bound to fail. As witnessed by human history, equalization attempts have always failed. Why? Because competitive diversity is the very life blood of nature (and human culture). Science has relied on hierarchies and it must continue to do that." (Kinne, 1999, p. 4).

⁴⁵ See e.g. Smetacek (2015).

⁴⁶ "The growing influence of science on human societies and their multiple activities has recently caused forces to enter the scene that are not part of the scientific process in its original sense; forces that are primarily fuelled not by scientific fact or

position on the political interference in scientific integrity made by the former U.S. President Donald Trump⁴⁷, the European Commission's Open Science policies and the development of its own publisher Open Access Platform⁴⁸, and cOAlition S funders (ultimately governmental) controlling research publication outlet choice⁴⁹. He was (naturally) protective of his business interests, especially against the distribution of "cheap copies" of articles, which he argued contributed to the serials crisis⁵⁰. Similarly, with indexing and abstracting services. On one hand he appreciated their usefulness against information overload, on the other, he viewed them as "secondary" publications living off the work of others⁵¹. Finally, he saw the publication model where authors are charged publication costs (rather than readers a purchase cost) as an *undemocratic* cost shift that would make science publication only for the rich and exclude thousands of scientists unable to raise the funds⁵².

Within the context of the serials crisis, total subscriptions (to the then five IR subscription journals MEPS, AME, DAO, CR and ESR) peaked in 2007⁵³. The many and varied reasons for the gradual industry-wide cancellation trend of the past decades all sum to the subscribers' need to extract more (against ever-increasing publisher prices, exponentially increasing research output) from stagnant or decreasing budgets⁵⁴ and the aim to break the pricing "tyranny" of the large publishers by demonstrating the subscriber market was not so "captive" as believed by favouring OA publication initiatives and eschewing subscription purchases. However, non-core research / teaching subscription cancellations aside, library amalgamations and/or closures and their replacement by expanding online networks may temporarily relax library budgets and increase accessibility for users but they decrease the overall number of subscribers available in the market, feeding the spiral. Additionally, there is the belief that online publication and distribution must be significantly cheaper for the publisher than print, so any price rises to maintain the same income over fewer and larger customers is "greediness"⁵⁵. IR was able to keep subscription prices relatively stable until

argument but by political or economical interests. These forces must not be allowed to compromise or distort established and proven methods of 'truth finding'. We cannot have lobbyists and pressure groups in science!" Kinne (2003).

⁴⁷ E.g. Goldman et al. (2020).

⁴⁸ See https://ec.europa.eu/info/research-and-innovation/strategy/goals-research-and-innovation-policy/open-science/open-access_en#latest

⁴⁹ E.g. "cOAlition S urges individual researchers, research institutions, other funders, and governments not to financially support 'hybrid' Open Access publishing when such fees are not part of transformative arrangements. cOAlition S emphasises that the individual cOAlition S members are not obliged to enter into transformative arrangements nor to fund publication costs that are covered by such arrangements." <https://www.coalition-s.org/addendum-to-the-coalition-s-guidance-on-the-implementation-of-plan-s/principles-and-implementation/> p. 2

⁵⁰ IR is not a member of any Copyright Clearance scheme and does not receive any monies from such schemes. All reproduction permissions are handled directly in-house. Depending on the copyright circumstances, these are generally forthcoming for no fee. Kinne trialled the U.S. Clearance system in the 1980s (one can see the system reference numbers and price printed at the bottom of early article first pages), but the annual returns were so low (a few dollars annually) he abandoned it as not worth the effort. IR does work in partnership with Research Solutions Reprints Desk in the USA.

⁵¹ "This augmented information spread supports and catalyzes the scientific process; it assists in preselection and uptake of information, and it represents a significant measure against getting buried by an ever-increasing output of primary information. However, commercial secondary publishers sell information which they have neither produced, nor quality-controlled, nor published in the first place. Often including only "the better publications" in their products, secondary publishers can build on the success of others and thus minimize their financial investment and risk (...). True, secondary publications reduce the information clog, but they also increase the information fog". Kinne (1988b, p. 278).

⁵² Kinne (1999, p. 3).

⁵³ The actual values are commercially sensitive information and cannot be presented here. ESR converted to full OA in 2015 (see below, this section).

⁵⁴ Not only due to the "serials crisis". Kinne wrote: "Critics have made out the black sheep: science publishers. (...) Strangely, the increasing cost of producing the scientific knowledge (more scientists, more universities, additional research facilities, new equipment, etc.) provoke less criticism than the increasing cost of publishing the end product of it all: the manuscript" (Kinne, 1999). I do not think professional librarians reading here will disagree that by 2007 those increasing research production costs were also being squeezed out of University Library budgets.

⁵⁵ On this Kinne wrote: "Electronic publishing eliminates the cost of printing, binding and posting. But it will never be free (...) Except for printing, binding and posting, the fixed costs remain the same whether MEPS appears on print-on-paper or electronic." (Kinne, 1999, p. 3). While this is true (production is a single line right up to the point where one set of outputs is generated to upload to the website and another set is generated to go the commercial printer), Kinne did not foresee the considerable IT component cost (servers, internet providers, network and software licensing fees) that has replaced (in fact, well-exceeded) the former printing costs. Additionally, the cost of maintaining permanent access to an ever-expanding information set has shifted from keeping the printed issue permanently available from the library to keeping the digital issue permanently stored and accessible on the publisher's server, i.e. shifted from the library to the publisher. I think the belief that digital publication must be significantly cheaper exists mostly because those who have similar digital tools and services

2016⁵⁶. Fluctuations in the annual subscription prices were mainly linked to increases / decreases in the number of volumes produced annually. For example, the online-only price per MEPS volume gradually increased by € 12 over the period 2008–2011, then remained constant for the period 2011–2015, and then increased by € 7 in 2016⁵⁷.

Open Access fundamentally returns to the pre-17th Century economic model of publishing: the (wealthy) author contracts the publisher to reproduce (multiple) copies of their work in a higher quality than the author's manuscript and pays the printer / publisher for the service. Combined with 21st Century digital technology, the advantages are that access to the publication is not restricted to subscribers only. Barrier-free global access is demonstrably better for research, education and society as a whole, and the author's personal recognition and career advancement in particular. The disadvantages are that publication is only achieved by the wealthy (thus risking a skew to the pool of knowledge), the cost is borne by one rather than spread across many, and the model is only economically sustainable when there is a large publication output, i.e. by large publishers or government subsidised platforms. This can be illustrated thus: Under the Subscription Model, let us imagine a single journal publishes 200 articles per year (note that with an article rejection rate of 51% this requires over 400 articles to have been submitted for peer review). Let us assume it has 250 library subscribers who pay a subscription of \$3000 each, bringing the journal \$750,000 or \$3750 per article annually (but each subscriber only pays \$15 per article). Under the Fully OA model, to maintain the same total income, either the journal charges the author an APC of \$3750, or, if the APC price is capped to e.g., \$750⁵⁸, the journal needs to increase publication 5-fold to 1000 published articles—without increasing any costs. Additionally, to maintain the scientific quality represented by the 51% rejection rate, that increase would require the submission of 2100 articles for peer review—again, without increasing costs (e.g. the licence fees charged to publishers by article submission software systems are linked to the number of submitted manuscripts).

Support for the OA model as fundamental to academic publishing became louder and increasingly fervent. Despite his concerns, Kinne introduced the “Gold” OA publication model was into IR publications in 2005⁵⁹, thus converting the former subscription-only journals into so-called “Hybrids⁶⁰”. Labelled “Open Access”, the model was what is now termed “Free Access⁶¹”. True OA publication under the Creative Commons by Attribution License (CC-BY)⁶² was introduced in 2013. To keep a wider range of pricing options available for authors / funders, the renamed Free Access model remained on offer at cheaper APC charges until it

delivered to their work desktops never see the true commercial cost of maintaining the provision of those services (and even then, there may be significant bulk discounts for a very large organisation such as University that are not available to a smaller commercial entity such as IR). Additionally, the ever-increasing number of post-publication services provided free of charge to individual researchers (e.g. Alt-Metrics, CrossMark, CrossRef, ORCID, etc.) are financed by charging the publishers to participate, which they are forced to do by customer demand, but at the same time discouraged from those costs accordingly.

⁵⁶ IR internal historical subscription price data.

⁵⁷ Calculated from historical subscription price data.

⁵⁸ As cOAlition S has indicated it will do. See Section 5 of e.g. <https://www.coalition-s.org/guidance-on-the-implementation-of-plan-s/>. Note the funder can anyway decide to cap the fee to any level, regardless of what the individual publisher needs to receive to break even. The figure of 750 was mooted in the initial draft Plan S, but taken out during the stakeholder feedback process.

⁵⁹ Announced in Kinne (2005b), perhaps with less enthusiasm than normal for new IR developments. He did not present the normal description of benefits of OA publication, but instead: “To remain at the forefront of scientific publishing, we are constantly exploring new avenues of making sound scientific knowledge available to a world-wide audience. Towards this end, we are pleased to introduce an open access initiative for MEPS and our other journals ...”. The first OA publication was the Theme Section “Politics and socio-economics of ecosystem-based management of marine resources” in that same volume (MEPS Vol. 300). “Gold” describes OA publishing for the payment of an APC.

⁶⁰ “Hybrids” are journals that are a mixture of subscription and OA publishing in the same title.

⁶¹ Anyone could access the articles immediately on publication, but re-use was subjected to standard copyright law (with copyright transfer to IR), not under a Creative Commons type license.

⁶² Use, distribution and reproduction are nearly unrestricted, provided the authors and original publication are credited. Copyright is not transferred to IR and remains with the present copyright holders. See

<https://creativecommons.org/licenses/by/4.0/>

was phased out at the start of 2016⁶³. Otto Kinne lived to oversee the introduction of the CC-BY model but not to steer much of its subsequent progress, passing away at the age of 91 in early March 2015 after a prolonged period of deteriorating health, but standing ever with his hand firmly on the tiller of IR⁶⁴.

No limits have ever been placed by IR on the amount of OA publishing—whoever selects the option and pays the APC, can have it⁶⁵. Until 2021, the APC prices were tiered based on article length, and from 2008 were set to partially offset subscription price increases, but also to remain realistically affordable for authors / funders⁶⁶. The APCs, however, do not reflect the actual publication cost⁶⁷. While fair in relation to the time spent on article production, the downside of the length-tiered system is that the final price is not known until after the author proof stage. This is too late for funding approval for many authors under Plan S (see Section 3), and so for articles submitted after 1 June 2021 a new scheme of fixed prices based on article type (Research, Note, Comment, etc.) is being applied, in line with many STEM publishers⁶⁸. Feature Articles and articles authored by Contributing Editors of the journal are granted Open Access free of charge. ESEP is presently published OA completely free of charge⁶⁹. For the Fully OA journals, APC waivers or discounts are available based on degree of contribution to the study by World Bank Low or Lower Middle Income country classification schedules; other needs are considered. Theme Sections are offered the chance to publish completely OA for a discounted price. APC prices have been increased roughly every 2 to 3 years⁷⁰. Over the last eight years there has been increasing relaxation of control over author self-archiving on websites or repositories (“Green” OA). Preprints, the Author Accepted Manuscript (AAM) and the Version of record (VoR) may be archived under various embargoes or conditions⁷¹. Additionally, in the third quarter of the fifth year after publication, the subscriber-locked articles are unlocked and made accessible to all users quasi under the Free Access model.

However, despite the hype and demand for the OA publication, the percentage of paid OA publishing of the total IR publication output has remained static over the last six years (Fig. 2). This is because in general, funding for the payment of APCs is not available⁷². If, e.g., MEPS were to completely “OA flip”⁷³ tomorrow, there would presumably be ca. 60 to 80% fewer submissions of articles to the journal as the majority of authors have no funding to pay APC charges⁷⁴. IR journals are also highly international journals. Progress and / or the desire to make funding available for APCs are at quite different stages, e.g., between Europe

⁶³ To encourage the use of OA and the Creative Commons Licenses (generally Free Access was no longer considered desirable by academia), reduce confusion among authors and users over the difference in the models and simplify production procedures.

⁶⁴ “A major problem with patriarchs of Otto Kinne’s calibre is the large gap they leave behind at their passing; they are remembered because they are missed, so what they established becomes the tradition followed by their successors.” (Smetacek, 2015, p. 6).

⁶⁵ I make this point because there seems to be a perception that publishers have sought to restrict or minimise OA publishing, especially in hybrid journals. Additionally, the language of Plan S (see Section 3) puts the onus for OA growth on the publisher, but the publishers have little to no control over this.

⁶⁶ The APC income was used to offset price increases necessary to cover the dropping income from the declining subscriptions, which would have been otherwise far greater increases. This is how IR kept its prices relatively stable until 2016. It is frustrating that proponents of the “double-dipping” theory (that publishers of Hybrids were reaping two lots of income from the same articles—from subscribers and from APCs) did not want to believe this is how APC income was being used.

⁶⁷ Data to show this is commercially sensitive, however from the initial processing of the article submission through upload online right to the mail-out of the printed journals, the average time spent on processing each manuscript by paid IR staff is around 40 hours. More detail on what proportion of the APC is spent on particular activities will become available later on the IR website as a condition of Plan S.

⁶⁸ See e.g. <https://www.int-res.com/journals/meps/about-the-journal/#tab2box>

⁶⁹ Completely subsidised by the income from all the other journal subscriptions and APCs.

⁷⁰ The last in 2019. The pricing structure change for articles submitted after June 1, 2021 will unfortunately represent an increase for some authors, but it is simpler and easier to calculate and conforms to Plan S transition requirements.

⁷¹ See <https://www.int-res.com/journals/open-access/>

⁷² “Plan S” is built on this premise, see Section 3.

⁷³ “OA flip” is when a subscription or hybrid journal switches immediately to Fully OA publication.

⁷⁴ At present APC discounts and waivers are not available for the hybrid journals, because the authors always have the option of publishing subscriber access at no cost. However, since Plan S transformative journals (see Section 3) should be promoting OA publication, this is presently under review.

and the USA. Both geographical areas are significant contributors of articles to MEPS; but to force or exclude either OA publication or subscription publication at the present time will include or exclude one market over the other. Either way, it can be said that enforced OA publication potentially restricts the market for overall article submissions to IR journals.

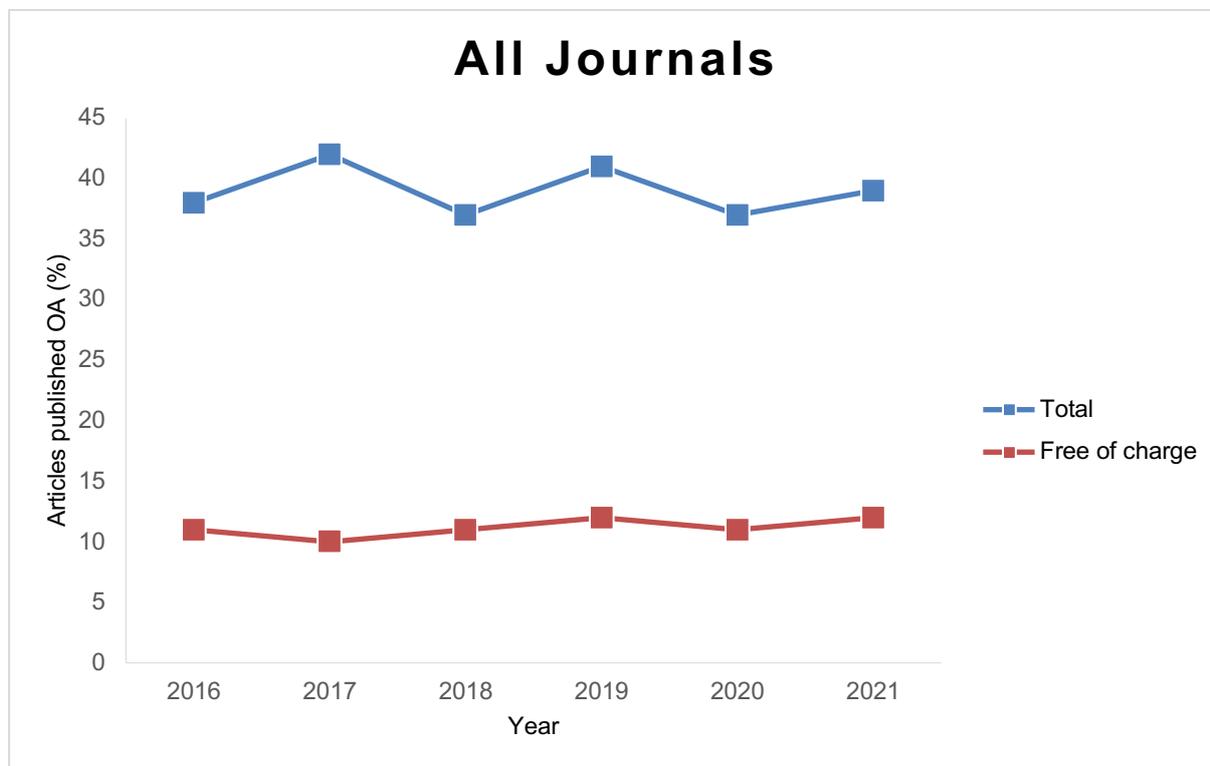


Fig. 2. Percentage of articles published with Open Access (OA) for the period 2016–2021 across the total Inter-Research publication output (representing 4 Hybrid and 4 Fully OA journals) (blue line). Also shown are the percentage published OA at no charge (orange line). The data for 2021 are from 1 January to 31 May. It can be seen that the proportion of authors selecting OA publication has remained static over the last 5 years.

Acknowledging the benefits of OA publication to science and society⁷⁵, and accepting that it was what authors and Editorial Board members wanted, in 2015 IR cautiously experimented with Fully OA publication by OA flipping AB and ESR⁷⁶. Until this time, while popular with authors (from the high numbers of submissions, especially ESR which occupies a fairly unique subject niche), both journals had few subscribers and were otherwise candidates for cancellation. Conversion to full OA publication was seen as the way to save both. Given the political drive behind the OA movement, it was expected this change would be popular and that both journals should subsequently thrive⁷⁷.

However, this was not the case. AB makes an interesting study. On its founding in 2007, it was initially Free Access at no cost to attract authors and to get the journal established. It converted to a Hybrid Journal in 2010 but attracted very few subscribers. Submissions however dramatically rose to a peak in 2012, and then went into a small decline. In 2013 it was announced that the journal would convert to Fully OA in 2014 (thus articles submitted in 2013 would be subject to paying an APC when published in 2014). Article submissions dropped 52% during 2013–2014 (Fig. 3) and have not yet recovered to the 2012 levels.

⁷⁵ See e.g. <https://www.enago.com/academy/benefits-of-open-access-publications/>

⁷⁶ Though in the first years not marked as Free Access in any particular way, ESEP had always been freely available and not locked behind the subscription barrier since its establishment in 2000. AEI was founded as a Fully OA journal, initially Free Access in 2009 and then Open Access from 2013. It never went through a subscriber-based hybrid stage.

⁷⁷ See e.g. the optimistic Section 5 of Seaman & Stewart (2014).

While other (unknown) factors cannot be ruled out, it does seem that a Fully OA journal is not a major attraction to AB authors.

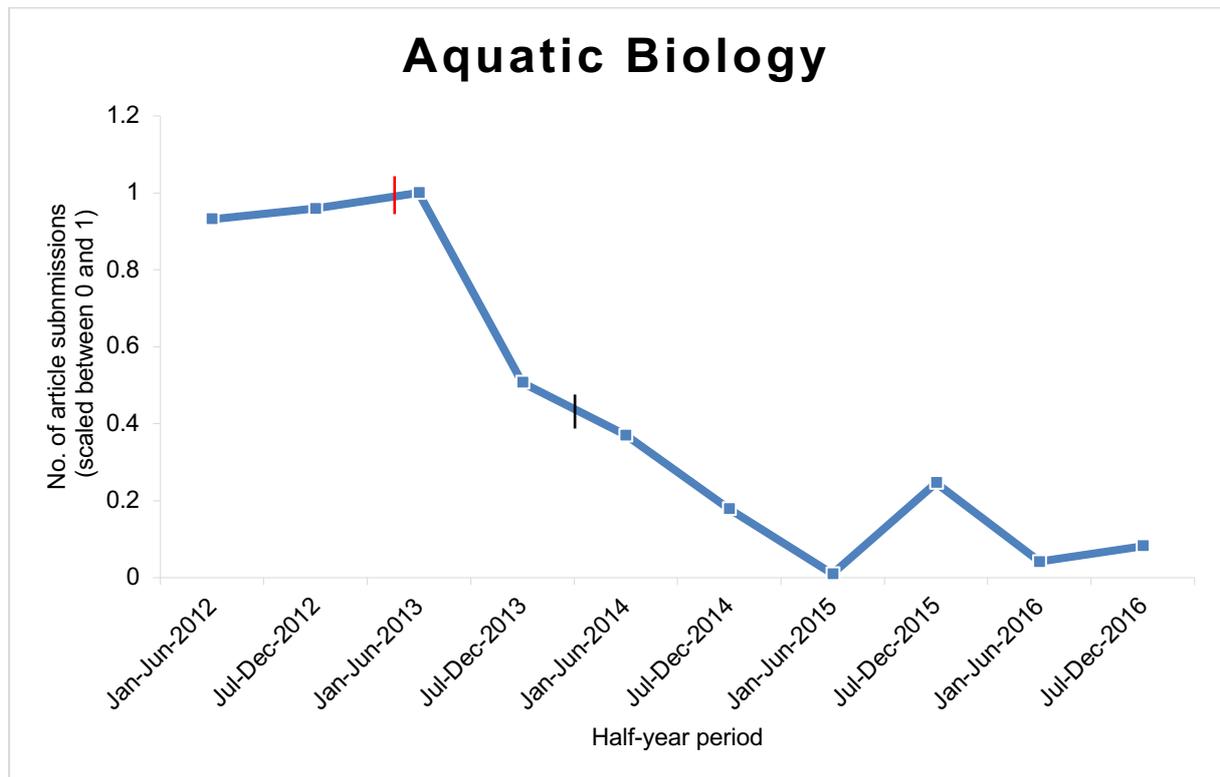


Fig. 3. January to June and June to December total article submissions to *Aquatic Biology* (scaled to between 0 and 1 to protect commercially sensitive data) showing the sudden drop in submissions after the journal “OA-flipped” (announced in April 2013 (red line) and coming into force from Vol. 21, 2014 (black line)).

Of the other two “paid” Fully OA journals, ESR submissions fluctuate, but the overall trend is stable. AEI shows consistent but very slow growth, but the overall number of submissions (and acceptances) are still too low for Fully OA to be self-supportive.

The sudden drop in submissions to AB and the static nature of ESR and AEI created sufficient alarm to suspend the OA-flipping of the remaining Hybrid journals (AME, CR, DAO, MEPS), and a manageable and successful economic equilibrium among the four Hybrids and the four Fully OA journals was reached that met the needs of most authors and IR. Then along came “Plan S”.

3. 2020–2021: Rogue Wave: Adjusting the Sails and Navigating the Safe Passage

cOAlition S is a consortium of “research funding and performing organisations”⁷⁸, international but predominantly European, whose goal is to promote the publication of all research using the OA model⁷⁹. In 2018 they launched “Plan S”⁸⁰, which requires that publications stemming from public grants must be published in *compliant* Open Access journals or platforms. By compliant, they specify conditions that have the goal of forcing the Hybrid publication model out of the academic publishing market, which has reached a too-comfortable equilibrium and therefore not actively progressing the goal of full OA publication for all science research.

⁷⁸ See <https://www.coalition-s.org/organisations/> and <https://www.coalition-s.org/supporters/>

⁷⁹ Also official policy of the European Commission, see <https://www.coalition-s.org/about/>

⁸⁰ See <https://www.coalition-s.org/why-plan-s/>

Beginning 2021, studies funded by Plan S signatories⁸¹ must be published with Open Access in a fully OA Journal, or in a Subscription-only journal that allows the AAM or VoR to be deposited in an OA Repository without any embargo period. In principle APC funding will not be available for Hybrid Journals (such as MEPS, AME, DAO and CR), but APC funding *may* be available for Hybrid Journals within the “Transformative Period” 2021–2024 if the journals become ‘Plan S compliant’, register with Plan S as “Transformative Journals,” and aim to flip to Fully OA by the end of 2024, or when a certain threshold of OA publication is met. It is quite important to note here that even if a Hybrid Journal is compliant, the funder can still refuse to fund the authors’ APC (additionally, the author will be heavily penalised by the funder if they still submit to the journal and pay the fee themselves) simply because the journal is a hybrid. Certain annual levels of growth in OA publication within the journal must be demonstrated for the journals to remain compliant and registered. In addition, the funding must be approved specific to the journal *before the article is submitted for peer review*. There is a “compliance tool” (accessible to authors but not to publishers) where a journal’s compliance specific to the requirements of the funding institutions can be checked. Presently no caps are placed on APC charges, though there are threats to introduce them if it is felt prices become unrealistic.

Though study funding sources are often quite nebulous to identify (e.g. the credited organisation in the article Acknowledgements may receive its funds from a not-obviously-connected government funder much higher up), it was calculated Plan S signatories represented a reasonable proportion of IR’s present author market and thus IR should work towards Plan S compliance.

The 4 Hybrid Journals have been registered as Transformative Journals with Plan S. Work is underway on the technical and other requirements (e.g. IR have recently joined Crossmark). IR has updated its Publication License to permit the sharing of the AAM version of articles funded by Plan S signatories under a CC-BY License with copyright retained by the authors (as required by cOAlition S) when the article is not published with Open Access. For the first time, subscription pricing for 2021 was calculated using an algorithm that accounted for the supposed double-dipping effect of the Hybrid APC fees. As already mentioned, IR is changing the APC fee structure so that authors have the final price before article submission in order to meet their funding application processes. On the IR website over the next year will appear more transparent statistics (levels of article submission and acceptance, times of review and publication, volume of OA publishing) and review and production cost information. Presently we are investing considerable resources into upgrading our internal digital systems and technologically enhancing the backend of the website, so that we can in a few years shift from what still largely a print-oriented publication system to a digital one.

As if the economic uncertainty around Plan S and its compliance to it was not enough, along came the Covid-19 pandemic. Two unexpected advantages of the pandemic were the rapid digitisation of our remaining paper-based systems, mostly in the area of proof-reading, and production control⁸² to facilitate Home Office work, and the mitigation of office crowding that had resulted from one of our buildings suffering severe flood damage a month earlier. Apart from the very small effects of introducing the OA “double dipping” mitigation pricing model, IR held the 2021 subscription prices more-or-less at the 2020 values as Covid-19 support measures for customers.

4. Beyond 2021: On Deck at Night Alone: Challenges and Uncertainties

With Plan S, small Learned Society and commercial publishers such as IR with a relatively low annual article output and a long-established reputation focusing on the integrity of the

⁸¹ See <https://www.coalition-s.org/organisations/> and <https://www.coalition-s.org/supporters/>

⁸² Long-desired but always blocked but some seemingly unsurmountable hurdle to overcome.

science and the quality of the production (which come with costs likely difficult to sustain under the APC publishing model), are in a challenging position, whichever way they jump. Not complying with Plan S as Transformative Journals will block article submissions from a significant proportion of the market that requires Plan S compliancy. On the other hand, immediate flipping to Fully OA publication risks the loss of submissions from a significant proportion of non-Plan S signatories worldwide where APC funding is not similarly available or provided on a different basis. Then, even if Plan S compliant, there is no guarantee that an author's application to submit an article to the journal will be accepted by the funder. For the author (and publisher) all choice is removed. The present IR APC fees alone do not cover present publication costs (and the threatened caps even less so), if the traditional rigor of scientific research presentation to be maintained. Fully OA publication will represent a significant drop in income per published article for small publishers. What effect will this have? It will likely drive small commercial and Learned Society publishers into cooperation with large OA "platforms". Eventually the monopoly of the two or three large commercial subscription publishers will be replaced by a monopoly of two or three large OA platforms, either in highly subsidised governmental ownership, or in highly priced private ownership; that is, with the latter, little will have changed economically from the present situation. In the Plan S Transformative Period, the *Publisher* must demonstrate an annual increase in OA publishing. *But since whether or not an article can be submitted to a hybrid journal is solely the decision of the funder, this is not under the control of the Publisher.* Thus, government funders have a tool to potentially target and shut down commercial publishers. For the publishers, there is great uncertainty in the economic future. This makes not only planning, but actual moving in any new direction extremely challenging (change, even towards better efficiency and economy, always requires initial extra expenditure). Finally, the funding that Plan S signatories originally planned in 2018-2019 to set aside for APC charges will be affected by the economic fallout of the Covid-19 pandemic. Additionally, so will library subscription budgets.

Little or no article production (copy-editing, layout, homogeneity of style) has become the accepted norm even with authors and is now the area where publishers are expected to cut costs to make OA publication viable. This is ironic as previously many have lamented the high prices set for journal subscription packages by large publishers who were then clearly increasing the profit margin by reducing quality and cutting expenditure on the fundamentals of publication: rigorous review, attentive editing, clarity in typography and presentation. Open Access is seen as the means to address this problem. However, rather than working to restore the quality-control procedures in science publishing that are accused of been short-cut in the last decades, the OA Publishing Model accepts them, encouraging further cuts by seeking ever cheaper pricing⁸³. Advances in post-publication distribution and services (e.g. alt-metrics) come at increased technological and financial cost. Essentially, the new OA models of academic publication are not article publication at all, but simply text distribution. The universal desire is to pay little for distribution and nothing for publication.

As I finalise this article, we are approaching half-way into 2021. As yet there is no positive impact of Plan S on the level of OA publication at IR (Fig. 2), hopefully because of the lag between article submission and publication (the articles being published now went into review when Plan S was not yet in operation). This is concerning though, because each IR Hybrid Journal needs to demonstrate an increase in OA publishing in this year (2021) to

⁸³ For example, the *Journal of Open Source Software* (JOSS), publishes Open Access for USD \$ 3 per article (Katz & Smith, 2021). However, it achieves this by relying entirely on volunteer effort; by borrowing heavily on Open Source software; by not having any business premises; and by dumbing down the review process ("reviews are checklist driven"). There is no publication production (no copy-editing, typesetting, etc.; the authors do all the work in mark-up language). The articles it publishes are simple descriptions of software, there is little analysis or critique of using it (critique and analysis require more in-depth reviewer effort). Roughly 30% of submitted articles are not accepted for review, and only roughly 5% are rejected after review. Speed and automation are the catchcry: "... fully open, fast, iterative, and including a bot ...". This is what Kinne feared. In my opinion, this is simply rapid article distribution, not publication.

keep its registration as a Transformative Journal. What will happen if registration is lost, is uncharted territory.

Kinne made three predictions with regards to electronic publication: “With respect to science, three things are certain, however: (1) There will be no principal changes in the way knowledge is created, quality-controlled and utilized by researchers. (2) There will be significant changes in the ways scientists communicate with each other, in which research results are presented, and in which knowledge is analyzed, disseminated, and digested. (3) There will be risks that endanger science as we know it today⁸⁴.” Two decades on, in retrospect he was right about (2) and (3), and because he was right about (3), his trust in (1) was misguided⁸⁵. In the 21st Century world where any study can be uploaded to an OA platform with minimal to no control, review or rejection, the way knowledge is quality-controlled and utilised by researchers and the general public is significantly changing. Quality is submitting to quantity, speed [and cheapness] are over-ruling exactness and performance⁸⁶. It is worth noting that just as the academic community seeks to abandon the subscription model in the economics of publishing, the software industry appears to be embracing it in the economics of selling or supplying software.

The continued support by funders, authors and subscribers of the IR Hybrid Journals over the next three years as IR navigates through the Plan S Transformative Period will be crucial for it to find the safe passage and reach port with both Fully OA Publishing and the IR brand quality intact. IR has been a proud sponsor of the IAMSLIC Conference annually since 2009. It has been a highly rewarding mutual relationship on business, professional, and personal levels. If the goals of cOAlition S are reached at the end of 2024, subscribers as a customer base will cease to exist, and a new basis on which to continue the relationship with IAMSLIC will need to be found. In the meantime, thank you all for your past, present, and future support for IR.

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⁸⁴ Kinne (1999, p. 1).

⁸⁵ For example: there was recently (2021) an accepted article where the authors were asked by the IR in-house sub-editors to clarify some fuzziness in their sampling methodology description. The authors seemed, despite repeated requests, unable to supply the answer. As it was a simple question that every researcher should have been able to answer from their field notes, this rang an alarm during final checks a couple of days before publication. Deep investigation revealed the authors were reporting as their own sampling dataset the summary data of an earlier, almost identical sampling study (by different authors) on the same species in a different geographic area, down to the means and standard deviations to 3 decimal places, which in nature is highly unlikely to occur. This would have been extremely difficult to detect by the reviewers unless one intimately knew the earlier study or sensed (as we eventually did) that something was not right. It took the intensive reading of the production process to pull at the initial loose thread. I highly doubt a “review checklist” procedure (followed by a production process of author self-correction) would have uncovered it.

⁸⁶ See Footnote 43, and Section 5 of Seaman & Stewart (2014).

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