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Abstract

A vast majority of Natural history institutions in Europe have been scientific publishers since they were founded and have a long scholarly publishing tradition. Nowadays, they are confronted with rapid technological changes and face complex strategic and technical questions related to visibility, access, format, and the financial structure of their titles. These specific issues require a common vision and an international strategy to ensure that the community acts in a consistent and coordinated way. A consortium of Natural history institutions is thus launching the *European Journal of Taxonomy* applying an alternative *public* open-access business model where neither authors, nor readers have to pay fees for subscriptions or publication. In this paper, we will focus on the benefits of open-access publishing and how *EJT* will play an important role in moving the field to open-access publishing and archiving by enabling the institutions to take a greater control over their communication process.

Introduction

Natural History Institutions (NHI), such as research institutions, herbariums, botanical gardens and museums, have been traditionally created to contribute to the understanding of the natural world and to disseminate this knowledge. Their core mission can be divided into three main objectives: 1) to carry out biological collection inventories, achieving and conservation (carried out by herbaria, zoological archives etc.); 2) to conduct scientific research on the natural history collections and 3) to disseminate scientific results within the scientific community and to the general public.

This is one of the reasons why NHI have been scientific publishers since they have been created, some of them as long ago as the end of 18th century. Indeed, as scientific establishments and public services, NHI have to make sure that publicly funded research is easily, and sustainably accessible to everyone who needs it, independently from geographic location or scientific domain. As the field of scholarly publishing is so rapidly changing, NHI publishers are facing rapid technological changes and an increasing abundance of information that requires dissemination. They face complex, strategic and technical issues related to the visibility, the access, the format and the financial structure of their titles. In taxonomy, as in any other scientific field, the growing dissatisfaction with the established scholarly communication system results from a variety of factors, including rapidly rising subscription prices, concerns about copyrights, slowness of publication, and low dissemination (Van de Sompel *et al.* 2004).

The real challenge for institutional journals is to keep up with the rapid developments in online services and standards while fulfilling their mission of dissemination of scientific results. These issues require a common vision for the institutions and an international strategy to ensure that the community acts in a consistent and coordinated way.

In 2008, under the umbrella of the 6th Framework Programme, the European Distributed Institute of Taxonomy (EDIT) research network of excellence established a group of publishing experts from NHI to critically address the rapid changes that are affecting scholarly publications in their field. This network has given birth to a new journal, the *European Journal of Taxonomy (EJT)*.

In this paper, we will describe the rationale behind the creation of *EJT.* This new e-journal is adopting modern electronic publishing practices so as to enable increased production and a wider circulation of the results of taxonomic research.

Publishing in taxonomy

Taxonomy and systematics involve classifying organisms according to natural and evolutionary relationships. The current system used by all scientists dates back to the 18th century, when the Swedish botanist Carl Linnaeus established (in 1735) a way of naming, ranking, and classifying organisms. Since then, all animals and plants have been named following an ordered system. To avoid the confusion that would be caused by several people giving different names to the same organism at the same time, the taxonomic communities have long-established codes of practice, including the *International Code of Zoological Nomenclature* (ICZN) and the *International Code of Botanical Nomenclature* (ICBN).

Nomenclature is the procedure of assigning names while taxonomy is the science studying natural and evolutionary species. The codes of nomenclature promote stability and universality in the scientific naming of animals and plants (ICZN 1999; ICBN 2006) and their compliance is essential to the field, to ensure that only one official and accepted name is provided for a designated species. Furthermore, the codes help to rationalise the scientific descriptions published. Indeed, taxonomic papers are legal documents that determine the legitimacy of a name of a (new) species. However, taxonomic publications cover every creation, description, classification, modification and use of a taxon.

For example, according to the ICZN, a species name is only valid once it has been published with a description of the species. This publication credits the author of the description as the 'author' of the new species. Therefore, both recent and historical publications are the primary sources in taxonomic studies. The taxonomy of any given group of organisms thus currently consists of the sum of the species descriptions and revisions published in the printed literature (Godfray & Knapp 2004; Smith *et al.* 2009). The scientific literature dealing with biodiversity has been estimated at approximately 5.4 million volumes (around 800,000 monographs and 40,000 journal titles) since 1469 (Gwinn & Rinaldo 2009). A key aspect of taxonomic publications over the past 250 years has been descriptions of species and their comparison to other species. The access to publications with descriptions of species is critical to the field. The lack of access to (or even the difficulty in accessing) published literature on biodiversity has always been one of the major obstacles to efficient and productive research. This is particularly true in the field of taxonomy, since the descriptions are scattered across thousands of journals, many of which are difficult to find and access.

The Internet and the digital world have radically changed the way taxonomy is addressed. Not only because it increases the accessibility and visibility of scientific information, but also because it has changed the way taxonomic research is conducted. As Godfray and Knapp (2004) noted, new technologic "innovations are likely to influence taxonomy in the next decade or so", because the web provides a much bigger capacity to archive the information than what is feasible on a printed format and allows innovative use of techniques and tools that are impossible in print, such as interactive keys; 3-dimentional images; movies, and sounds. Taxonomy is one of the sciences that would benefit from Internet browsing and cross linking resources. Moreover, taxonomic treatises can be long papers, often considered monographs, with many illustrations and aimed at a specialised audience (Godfray & Knapp 2004; Scoble 2004; Smith *et al.* 2009). The need to accommodate large papers restricts the numbers of papers that taxonomic journals can afford to publish each year, especially in print. This places a special financial constraint on the business model of taxonomy journals.

Major progress has been made in two main areas: the compilation of catalogues of species (such as the International Plant names index (IPNI), Catalogue of Life, World Register of Marine Species, The Plant list) and the digitalisation of Museum (including libraries) and herbarium collections (see the programmes Global Plant Initiative Project and the Biodiversity Heritage Library) (Godfray & Knapp 2004). However, three particular challenges prevent journals, especially institutional or small journals, moving online (Bénichou & Duin 2009). These relate to archiving, rules of the codes of nomenclature, and journal exchange programmes with other institutions.

Challenges faced by NHI publishers

Most of the journals are long-standing titles with a long shelf life because of the legal status of taxonomic names. Thus the sustainability of the online support and the access to the journal archives must be guaranteed before going electronic. It is crucial to the field to ensure that the information will still be readable within centuries.

The second problem for e-only taxonomic journals is intrinsic to the field. The current use of nomenclature rules in zoology, botany and microbiology differ in regard to the recognition of species names in e-only publications. However, Nomenclature Section of the International Botanical Congress, held in Melbourne in July 2011, decided that new names in botany may be published in electronic format only (i.e. without the distribution of printed matter) starting from 01.01.2012 (Cressey 2011). In order to ensure a perennial access, publishers are strongly recommended to provide the articles in a format compliant to archive such as PDF/A files. Regarding the ICZN (1999), electronic publications are allowed, provided the deposit of five copies in major libraries. Article 8.6 of the *International Code of Zoological Nomenclature* says that "for a work produced after 1999 by a method other than printing on paper to be accepted as published within the meaning of the Code, it must contain a statement that copies (in the form in which it is published) have been deposited in at least 5 major publicly accessible libraries which are identified by name in the work itself". We hope that the zoologists will soon follow their botanical colleagues and accept e-only publication, providing a perennial access, as valid for the description of new species and nomenclatural acts.

The third barrier, which would prevent institutional journals to shift from paper to e-only journals, concerns the library exchange programmes. For many decades, libraries saved costs in subscribing to journals by using their journal to exchange with the journals of other institutions. These exchange programmes could concern hundreds of titles and could thus be important for the libraries of the NHI. Going e-only would mean that the institutional libraries would not be able to acquire publications for "free" as they used to, because institutions that go "e-only" cannot provide their exchange partners with an exchange copy, except if they are able to give free online access. The exchange programmes have been a significant source of acquisitions for research libraries in NHI, almost since their origin. For instance, 35% of the books and journals of the scientific library of the Natural History Museum of London come from exchange programmes with others institutions (Bénichou & Duin 2009). However, such exchanges are now in decline (fig. 1) and we need a clear policy within European NHI to manage this decline in an elegant and cooperative way. Of course, if all journals went electronic then they could still be exchanged; but this will require coordination and planning. For example, it would be necessary to define what "exchange for free" means, because the exchange programmes do have a cost to institutions, for example in printing extra copies and especially in mailing them. Although the exchange programmes are generally perceived as being cheaper than purchasing access, it is not a free service. Mailing hundreds of free copies around the globe indeed amounts to a significant budget.

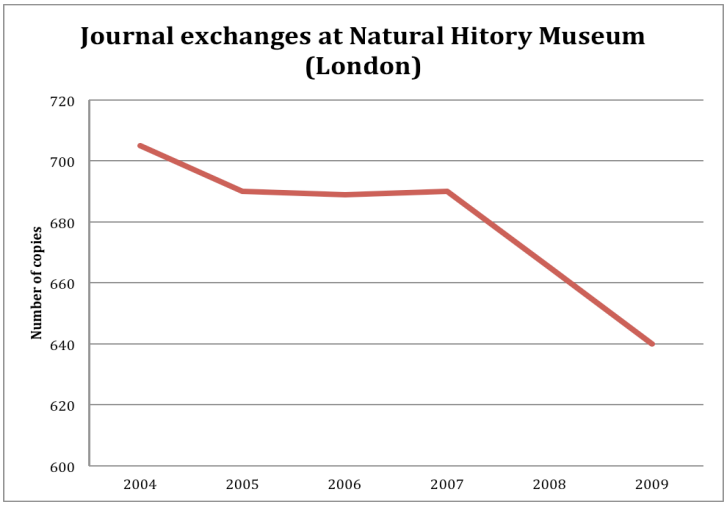

Fig. 1. — Recent changes in journals exchange at Natural History Museum (London) (from Graham Higley presentation at the 2nd Scientific publishing within Natural history meeting, Bratislava, June 2009).

Nevertheless, ending the exchange programmes would need to involve all libraries and academic presses of all institutions concerned. This, more than any other subject, would require a common vision and a collective (European) strategy, because without European cooperation it would contribute to the fragility of the acquisitions of libraries, the budgets of which are already stretched by the annual increase in subscription fees of commercial publishers. According to the report of the European Commission of 2006 (Dewatripont *et al*., 2006), the prices of the journals increased between 1975 and 1995 from 200 to 300% over the inflation. Since the technological revolution of 1995, the prices continued to increase, but less so than before. The same report indicates that the prices of journals, for a given discipline and in equal quality, published by commercial publishers, were increased three times more than those published by not-for-profit publishers such as NHI.

Publishing within natural history institutions

In the past decade, electronic publishing has changed the scholarly publishing landscape for publishers as well as for readers. For publishers, e-publication offers a new *medium*, which has dramatically improved the access to the scientific information they publish. This speeds up the publication process, so information becomes available to the public much faster and provides additional services to readers. Publishers of scholarly information and libraries will have to adapt their workflows and business models to these new technologies with significant implications for their organisations (Dewatripont *et al.* 2006).

Many NHI publish one or more research journals, often in-house. Most of the time, journals are run by isolated members of staff. Very few institutions have a complete publishing team. In addition, publishing institutions are confronted with various technological revolutions in scientific publishing that pose complex and strategic questions. The lack of technical and editorial staff in the institutions that would be able to address these technical issues is problematic. This lack of expertise, skills and knowledge prevent the institutions from being

innovative in their mission to disseminate the scientific results. It is essential today to invest in a strong network of skilled professionals in scientific publishing that will be able to innovate and contribute to a set of common policies for the dissemination of publicly funded scientific information in natural history. As shown by Crow (2006), "this lack of in-house resources becomes especially critical as the transition to electronic dissemination accelerates". In 2008, publishing staffs and experts within NHI began to meet under the umbrella of the EDIT network in order to address these issues.

The European Distributed Institute of Taxonomy (EDIT) is a consortium of 29 leading European, North American and Russian taxonomic institutions funded by the European Commission, from 2006 to 2011 (http://www.e-taxonomy.eu). More than 100 titles have been listed by these institutes, of which sixty-five journals are currently produced out of the 25 of the 29 EDIT members that are publishers. Three quarters of them are related to taxonomy and systematics. In 2011, only 78% of these 65 institutional journals are available online and 50% are open access (i.e. 28% online but reader pays by subscription). This compares with 96% of the STM journals being available online by 2008 (Ware & Mabe 2009).

The publishing process within NHI does not differ from scholarly publishers in other fields. Like other publishers, they deal with print technologies, copy editing, layout, print-runs, proof-reading, international standard numbers: ISSN (International Standard Serial Number), ISBN (International Standard Book Number), DOI (Digital Object Identifier), peer-review process, obtain ISI impact factors for their journals, abstracting services, optimisation of dissemination processes, and intellectual property rights and fair-use.

NHI can bring together all the actors of the editorial chain, including scientists (as authors, referees, editors, readers) and all the technical side of the job (desk-editors, publication managers, librarians). Rowlands and Nicholas (2005) report that 76.7% of the authors are at some stage referees, 8% are also editors-in-chief and 23.6% are part of an editorial board. This is a real asset for the collaborative approach in *EJT*.

Most natural history publishers are not-for-profit publishers, while many scholarly publishers are commercial businesses or aligned with commercial publishers. It is difficult to estimate how many of those journals are presently published by the NHI themselves, and how many are outsourced to a commercial publisher or are published on behalf of the NHI by a commercial publisher. Based on Crow (2006), we extrapolate the ratio of journals published by commercial publishers to reach 62%, among which 17% are published on behalf of institutions. Among the 65 journals studied here, 18% are actually published by a commercial publisher on behalf of the NHI to which they belong.

All NHI apply similar editorial processes, and their publishing departments, if present, have strong relations with the international (natural history) libraries to sustain the exchange programmes. In general, the institutional journals are long standing journals (30% of them are at least 60 years old and 16% are older than a hundred years) with low-print run (between 50 and 500 copies). Studies on the costs of scholarly publications (Houghton *et al.*, 2009; Wellcome Trust, 2004) show that public funds are the major contributor to the costs of a publication (salaries for authors, editors, and referees - Table 1). Traditionally, public funds are spent on reader subscriptions or author-paid fees for open-access (OA). These fees

include profits for commercial publishers, when the journal is outsourced to a for-profit publisher.

Table 1. Publishing activities and access of scholarly information. Workflow sections financed with public funding.

	For-Profit model	For-Profit model OA	Not-For-Profit model	Not-For-Profit model OA
RESEARCH by author	YES	YES	YES	YES
REVIEW process	YES	YES	YES	YES
EDITING	NO	YES*	YES	YES
LIBRARY subscriptions	YES	NO	NO	NO

*author-pays (= institution, but not always)

However, NHI, scientific societies or small publishers produce many taxonomic publications. Indeed, in the year 2000 around 15% of the marine species described per year were described in a journal run by an institution (Ph. Bouchet unpublished data). If you consider also the journals published on behalf of an institution, the percentage raises to 27%. Thus NHI journals are a significant contributor to taxonomic publication. This is even more so, as most 'other' journals are more and more reluctant to consider publishing descriptive taxonomy, as it produces low-impact articles, at least in the short-term (Agnarsson & Kuntzer 2007). Amongst 33 journals of the EDIT partners, 1450 new species were described in 2010. This is at least 8% of all the species described worldwide in 2010.

As scientific publications are the fruits of public-funded research, we strongly believe that scholarly publications should be made accessible, free to all. Moreover, there is evidence that not-for-profit publishers price their products at one third of the price of the ones of for-profit publishers (Dewatripont *et al.* 2006). By publishing their own journal, the partner institutions are able to set conditions of access to the publicly-funded research which they perform, while adopting modern publishing practises provided by the digital world.

There is a growing consensus that results of publicly funded research should be made accessible to all (Costello 2009). The open access movement has gained support in the research community and has given birth to collective declarations such as the Budapest and Berlin declarations[1]. However, there are still strong economic forces at work and commercial for-profit publishers are reluctant to risk the guaranteed income of low-circulation, specialized and expensive journals that are purchased by a few specialised libraries. Similarly, learned societies simply cannot abandon the income from their journals, because the publication of their journals depends on these revenues (Godfray & Knapp 2004). And yet, moving online will with no doubt improve the visibility of those journals and thus increase their citation rates.

[1] Berlin Declaration on Open Access to Knowledge in the sciences and Humanities (2003) : http://oa.mpg.de/berlin-prozess/berliner-erklarung/ By April 2011, 302 foundations, universities, research institutions, libraries and museums have signed the declaration.

Budapest Open Initiative (2002) : http://www.soros.org/openaccess/read.shtml

Even though the ISI impact factor (IF) is criticized in scientific fields such as taxonomy, and although various alternative metrics are being developed (Thomaz & Martens 2009; Duin & Besselaar 2011), the impact factor is still a measure widely used by various universities and funding agencies to evaluate scientists according to the IF of the journal they publish in. The citation life of a taxonomic paper lasts decades or even centuries rather than years, let alone months. Thus taxonomic journals tend to have a low citation rate during the 2-year period used to calculate the IF. This is one of the biggest disadvantages of traditional taxonomic publishing: journals are more and more reluctant to consider publishing descriptive taxonomic publications because of their low short-term citation rate (Agnarsson & Kuntzer 2007).

Among the 65 listed journals published within EDIT, we classify them into three groups:

- Small journals with no impact factor that fail to attract good papers and struggle to publish. They are faced today with a high-risk of extinction.
- High impact journals (with impact factor around or above one, which is a good impact factor for descriptive taxonomy) that attract more papers than they can handle rapidly, which makes the publication time line longer.
- Journals commercially outsourced that have lost their editorial control. Indeed, under the influence of the rush for ever increasing IF, those journals have shifted their editorial scope from low-impact, descriptive taxonomy to phylogenetic and molecular research.

The result is that today there are fewer institutional-driven communication channels for alpha- (descriptive) taxonomy, and these usually do not have wide circulation.

In order to break out of this downward spiral, a consortium of NHI has launched the *European Journal of Taxonomy* (*EJT*), applying an **alternative *public* open-access business model where neither authors, nor readers have to pay fees for subscriptions or publication.** These costs are being borne by the supporting NHI.

The *European Journal of Taxonomy*

This project has been initiated by a task force of six people from the EDIT network who have worked together during the past two years (from June 2009) to propose a joint journal that would solve some of the issues identified to shift from paper to e-only publishing for institutional journals in taxonomy. The group has been mandated by the EDIT Board of Directors, constituted by one representative of each of the 29 leading institutions members of the EDIT network, and other taxonomic organisations including scientific societies.

This task group includes one representative of each of the founding partners, combining the different competencies needed to create and run a scientific journal[2]. In April 2010, this task force proposed the creation of the *European Journal of Taxonomy* according to the analysis developed within the Business plan (Bénichou *et al.* 2010) required by the Board of Directors and which is summarized and developed in the present paper.

[2] The current six first authors of this paper.

During the last ten years or so, at least four new taxonomic e-journals have been launched. Prominent amongst these are *Zootaxa* (launched in 2001) and *Phytotaxa* (launched August 2011) both published by Magnolia Press, and *Zookeys* (launched in 2008) and *Phytokeys* (launched in 2010) published by Pensoft. All are led by taxonomic researchers rather than the big commercial publishers. The success of *Zootaxa* in particular, which now publishes almost ten times more new animal species descriptions per year than the next ranked journal, demonstrates the benefits of moving to e-publishing in taxonomy. These journals have quickly attracted a high number of papers, demonstrating clearly that there is a need for modern online taxonomic journals. In 2006, *Zootaxa*'s Chief Editor and founder remarked "although there are many journals that may published taxonomic papers, it is increasingly difficult to publish papers on descriptive taxonomy in a timely and cost-effective manner" (Zhang 2006). Five years later, the ever-increasing size of the mega-journal that *Zootaxa* has become confirms this statement. These e-journals have brought a number of benefits to the taxonomic community and will hopefully continue their performance. Nevertheless, we take the position that there is still a need for NHI to continue acting as publishers of taxonomic information. Following the recommendation of the business plan, the representatives of five institutions have signed a co-publishing agreement in the autumn 2010, creating the *European Journal of Taxonomy* (*EJT*) as a co-published journal, owned by the participating institutions.

EJT is based upon three main principles of open-access, no fees to authors or readers, and permanent archiving of published content:

1. Open-Access

Since it is their mission, NHI will ensure, by way of a free OA journal, that publicly funded research is easily, freely and sustainably accessible to everyone who needs it, independent of geographic or scientific domain. *EJT* will satisfy the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities. On the website, the journal will offer an interactive upload facility for information sources and databases which form part of the wider community in biodiversity sciences e.g. Encycopedia of Life (EoL), Biodiversity Heritage Library (BHL), Global biodiversity Information Facility (GBIF), International Plant Names Index (IPNI), Public Library of Science (PLoS), etc.

2. No financial costs to authors or readers.

EJT endorses the view that the ability to use and reuse data as freely as possibly is the key to innovation and the further advancement of science (i2010 Digital libraries initiative, December 2009: 9). Therefore the most suitable economic model of *EJT* is online open access without article-processing charge. This economic model will take away possible barriers for researchers to publish their work and for other researchers to cite and refer to previously published data.

3. Permanent open-access archives

Coordinating institutional resources will contribute to excellence, prevent repetition, and increase efficiency, while providing a secure long-term platform at minimum cost. To

ensure the long-term storage of the articles and so to solve the problem of sustainability of the support, *EJT* follows the LOCKSS principles[3].

Following these principles, *EJT* is an international, fully electronic, fast track, peer-reviewed, open access journal in descriptive taxonomy, covering subjects in zoology, entomology, botany, and palaeontology, run by an editorial and a production team on behalf of the institutions that own and fund the title. There will be no size limits to articles, and the production costs will be borne by the supporting NHI.

EJT's scope is global; authorship and geographical region of study are not exclusively European. Authors are invited to involve European natural history collections by consulting extant material, or by depositing (type-) material related to the published paper in the collection of a European NHI. We support and agree that the "scientific community expects that type specimens will be deposited in suitable collections (e.g. museums, herbaria) and most journal editors make such action a prerequisite for publication of a print paper" (Costello 2009), the same policy applies to *EJT*, giving the title a strong anchorage in a collection-based scientific environment.

EJT's management structure is similar to a typical academic peer-reviewed journal, comprising a steering committee (basically representatives of the owners) and a management committee (basically the editorial team: combining desk-editors and editors). One of the biggest challenges in the day-to-day management is precisely to bring together the editorial and technical team scattered through several countries in Europe and to organise an efficient production process and editorial workflow. The organisational principle of the journal is to make use of copy editors trained in taxonomic research and employed by the publishing NHI. Researchers will only be asked to invest time where their scientific expertise is needed, that is as authors, on the editorial board, and the peer-review process. Frequently, in scholarly publishing today, a number of journals are run completely by scientific personnel who fulfil both the editor and desk-editor roles. The latter technical work, carried out by scientists, is often invisible in a journals' business model, but is expensive for the organisations involved. In accordance with the philosophy of the *EJT* business model, we envision being more cost-efficient by hiring lower salaried but specialist professional copy editing staff to do this work; thereby letting taxonomists focus their time on their research.

The costs per page and average costs per manuscript covering personnel costs for a desk editor and IT maintenance have been estimated at approximately €1122 per article for a good-to-high quality subscription journal, and €1258 per article for a good-to-high quality author-pays journal (Wellcome Trust 2004). Ware and Mabe (2009) estimate first-copy costs per article to be around €1146. *EJT* uses an alternative economic model to produce articles for a similar price (*c.* €1129 per 25-page article).

The electronic distribution and enhanced online access of *EJT* articles need an IT specialist to maintain the website, the archives, and to put in place the linkages with other biodiversity

[3] **L**ots **O**f **C**opies **K**eep **S**tuff **S**afe. The Journal's articles, in .PDF and XML formats, will be deposited on the servers/data centres of the global Biodiversity Heritage Library partners. Initially, these will be in the UK and the USA. Subsequently, data centres will be added in China, Australia and South America.

databases. We will have to adjust the amount of technical time invested in *EJT* to the number of pages to be published. This will strongly depend on the number and quality of the papers submitted.

Working daily with a team scattered through several countries in Europe is challenging. In order to facilitate the way people are going to work together, we have decided to use a journal submission and tracking online system. The open-source Open Journal System (OJS) has been chosen at first, because it shares the open access model and the spirit of *EJT*, and it is already compliant with the scholarly publication world (peer-review management, LOCKSS system, creative commons licence, open access facilities…). The website of the journal is maintained by the IT staff from London.

Once the papers are accepted for publication, after having been edited and laid out, a linked PDF, a PDF/A version (in order to be compliant with the Botanical code), an XML version and a HTML version will be downloadable from the website. The idea is to structure the articles in an XML format that will enable effective and efficient data exchange. The data (names of species, description, geo-location…) must be extractable by as many as possible useful databases in the field: EoL, Consortium for the Barcode of Life (CBOL), Catalogue of Life, World Register of Marine Species (WoRMS), IPNI, Zoobank. *EJT* thus aims to offer all the modern interactive web-based facilities of high-level, high impact journals. It provides links to all leading biodiversity related databases in which new names of species and genera will automatically be included.

As outlined above, long-term archiving of taxonomic publications is essential for the field, and NHI have been doing this for close to 200 years. Curating collections, of specimens, of libraries and of databases, is the core business of NHI, and their public-funding business model ensures that they can be relied on to provide secure long-term curation. This is also true for electronic publications: NHI have a government-secured position, which makes their long-term archiving more reliable than that of most commercial publishers that come and go, merge with each other, or disappear altogether from the market. *EJT* will secure its published volumes using both PKP's Open Journal System (implemented on the servers of the NHM in London) and the Biodiversity Heritage Library, also in NHM, London. Both sites have secure mirror sites in several other locations around the globe.

The copyright issues, often presented as one of the big concern when moving online, are avoided since the journal is Open Access and requires the authors to accept a Creative Commons licence that allows others to share the work as long as they acknowledge the work's authorship and initial publication in this journal. *EJT*'s registration has been based in France for copyright reasons. French law on copyright explicitly allows the use and reuse of data published for scientific or educational purposes, as long as the authors are credited with their work.

A benefit for one user group will often benefit another, since they are often the same people, but wearing different hats (author, reader, editor, reviewer, etc. – Table 2). We expect that all will benefit from the collaboration of publishing expertise from different EDIT institutions in one journal. *EJT* has to contribute to setting standards in scholarly publishing that are favourable for the dissemination and access of taxonomic information.

Some existing NHI-journals have been merged with *EJT* as soon as it was launched, namely the *Bulletin of the Royal Belgian Institute of Natural Sciences – Biology and Entomology*, *the Journal of African Zoology* of the Royal Museum for Central Africa and *Steenstrupia* of the Natural History Museum of Copenhagen. Other journals may merge in the future. The project guarantees naming of the discontinued titles and cross-linking to the Web site and online archives of the titles. The *EJT* website does not maintain or host the archives of the discontinued titles as this will be managed by BHL. The other partners of *EJT* (the museums of Paris and London and the National Botanical Garden of Belgium) will add *EJT* to their journal portfolio.

TABLE 2. BENEFITS FOR DIFFERENT USER GROUPS

Users • Access to results including high quality independently peer-reviewed information, images and data • Ability to access content through other portals (e.g. EoL, GBIF, BHL, PLoS, etc.) • Use only those parts of the available information that they really need
Authors (researchers) • Submitting their papers online, without charge should encourage professional and non-professional taxonomists located in all countries to submit their work for publication • Fast-track publishing and increased visibility because of the open access model, integration in online portals and upload to other service providers and by publishing under Creative Commons licence • Greater citation rate due to greater accessibility and links with other online resources • Reliable archiving
Publishers (e.g. institutions joining the consortium) • Increased visibility by being part of a state-of-the-art European project • Increased authority on the dissemination conditions (scope, format, access and achieving) and so guarantee a favourable environment for the field • Live up to their public engagement missions • Adjust the *EJT*'s scope to ensure relevance to their institutions and the taxonomic field. *EJT* will encourage the submission of papers based on the consortiums' collections • Strong political message within the European Research Area and good image of the consortium members, whilst providing an identifiable output from EDIT
The taxonomic field • Strong political signal to the wider scientific community about the importance of taxonomy • Compliance with the nomenclatural rules and subsequently take part in the debate on the adaptation of the rules so as to allow "e-only" publication • Strengthen the image of the field by making taxonomic information more visible, easily accessible and reusable

Conclusion

Journals do not only disseminate information, they also provide a mechanism of quality control and certification for the results published. Species names and descriptions are the primary metrics in quantifying biodiversity, including communicating information about human food, ecologically important species, pests and pathogens, and species of popular and conservation interest. For taxonomy the close link between publication and research is even more crucial, as publications are the legal document validating naming of organisms. Moving online increases accessibility to taxonomic information and long-term preservation is ensured by electronic archiving. However, "such long-term preservation is a public-interest mission that may require public-sector commitment and funding, since one cannot expect or wish private actors to earn a sufficient return on this activity" (European Commission 2006). *EJT* is an example of institutions adapting to modern technologies so as to better fulfil their public mission.

The creation of this new journal is a strong political message to national and international funders of natural history research, showing the interest and capacity of NHIs in different countries to join forces and collectively claim a significant role in the organisation of access and dissemination of scientific information in their domain of research. By publishing their own joint journal, the institutions will be able to set conditions of access to the publicly-funded research they perform.

EJT builds a European cross-institutional cooperation through light governance, which enhances coordination in order to set up a cross-institutional strategy at the European level and promotes the adoption of common standards and ways of working, wherever possible. It also shows the ability of technical and scientific staff to learn to work together interactively.

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