

# Turning a page: remaining a top competitor in an evolving publication ecosystem

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## ABSTRACT

Journal of Experimental Biology (JEB) is celebrating its first 100 years this year. My own relationship with the journal spans over six decades and encompasses a variety of roles: reader, author, Editor (1995–2000), Editorial Advisory Board member (2000 to present) and Director on the board of its publisher, The Company of Biologists (2003–2009). I was therefore delighted when the journal Editors asked me to write a Perspective to reflect on how the journal and the publishing environment in which it competes have evolved over this long period, and to peek into my crystal ball and comment on what the future might hold for the journal and the primary fields it covers: comparative–environmental–evolutionary physiology, neuroethology and biomechanics.

**KEY WORDS:** Adaptation, JEB history, Literature evolution

## When paper ruled the day

One of the first images that came to mind when I thought about my long involvement with JEB was the regular treks I would make, back in the pre-electronic publishing days, to the university library to check out the new journals shelves. In the olden days of paper-based dissemination of scientific discovery, it was necessary to unglue oneself from the tasks lying on one's desk, leave the office and walk to the library to see what was new. Back in those days, tracking the literature in comparative physiology was relatively simple: essentially, all papers of relevance were published in a dozen or so journals, all of which would be neatly displayed on the new journals shelves. In those visits, I'd almost always make my first stop at the site where recent issues of JEB were lodged. Typically, I found such interesting material there that my visits often ended with the latest copy of the journal, which in those days was hardbound and had a beautiful colored photo of a critter on the cover. That format certainly gave the papers the cache of being permanent additions to the scientific literature. JEB became our lab's favorite place to publish, and I can recall the joy that arose when we got a manuscript accepted, especially if we lucked-out and had the photo we submitted with the paper accepted for the cover.

When I became an Editor in 1995, I began to receive my own copies of the journal, which I proudly displayed on bookshelves outside my office. On retiring from my faculty position in 2014, my replacement asked whether he could keep some issues to show his new students what things used to be like. I'm happy to say that these volumes are still displayed on his lab's book shelves. For someone of my generation, it's astonishing and a bit disconcerting to realize that, as Hans Hoppeler noted in the wonderful 'Auf Wiedersehen'

Editorial he wrote when he handed the reins to current Editor-in-Chief Craig Franklin, the digital revolution in publishing has made 'print issues of journals an unnecessary oddity' (Hoppeler and Franklin, 2020).

Several years before print issues of journals reached this evolutionary status of 'oddity', I had the opportunity to experience the full suite of processes that led from a freshly submitted manuscript to its appearance as a publication in a volume reflecting the highest editorial and production standards. I made my first visit to the JEB epicenter at the University of Cambridge, UK, when Bob Boutilier was Editor-in-Chief (1994–2003). Accustomed to shiny new science buildings at my university on the West Coast of the USA, I was surprised at how old and dark everything appeared as I entered the complex of buildings in which Bob's operation was housed. However, any snobbish misgivings on my part were soon dissipated when someone casually mentioned that the laboratory we were walking past was where the double helical structure of DNA was discovered. Talk about putting things into perspective!

Bob's editorial office had the aura of a highly effective family-run enterprise blessed by a great staff that worked together harmoniously. Margaret Clements, chief JEB Administrator, might be regarded as the 'mom' – certainly as the organizing center – of this family-like operation (Knight, 2011). Her personal warmth was paired with outstanding administrative skills. She received and organized all the incoming manuscripts, which in those days arrived as triplicate hard copies packed into large envelopes. Margaret was a master in keeping entropy to a minimum. She used wire baskets to sort incoming papers into groups for further processing. I was charmed by the sympathetic way in which Margaret helped Bob cope with the enormous load of manuscripts that crossed his desk in those days, when JEB had a much smaller staff and manuscript processing involved a lot more effort than in the present era of web-facilitated movement of documents. Their enjoyment of working together and their passion for the journal played key roles in ensuring effective processing of top submissions into first-rate publications.

On my first visit to the Bidder Building on the outskirts of Cambridge, where final production of the journal was carried out, I saw the multiple laborious steps that were entailed in converting a manuscript into a final polished document. Of special importance, the text was given lots of skilled attention by the Production Editors, who cleaned up the prose and molded it into JEB quality. I must confess that from my very first submission to JEB up to the present day, the critical eyes of the Production Editors have always found room for improvements in my writing. I was always filled with a mixture of appreciation and embarrassment when one of them suggested a better way of structuring a sentence, or even a whole paragraph. JEB's reputation for editorial excellence is well deserved and ubiquitous in the research community it serves.

Back in the days before web-based submission and review, a manuscript in hard-copy form was subjected to a lot of travel over a

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lengthy period of time. I well recall the big courier envelopes containing manuscripts for assessment that arrived almost daily at my university mailbox. I would bring these packages home where my wife and editorial assistant, Dr Amy Anderson, would assist me in dispatching papers to appropriate reviewers or return them to authors for revision. In those days, agreement to review manuscripts was commonly obtained via exchanges using a fax machine, communications that could be slow and frustrating. Reviews were often returned by facsimile as well, so the moaning noise of my home fax machine tended to be heard at all hours of the day, 7 days per week. Manuscripts often saw the insides of several courier envelopes as they jetted around the planet before the final revised manuscript was sent to Cambridge. Suffice to say, the quantities of paper and carbon emission associated with publication were a lot higher than they are today.

### Retaining excellence and increasing relevance in the era of electronic publishing

The ability to download a pdf of a paper from a journal's website within days of it being accepted for publication is, perhaps, the most remarkable advance that readers have benefitted from in the electronic publishing era. However, despite the ease-of-access benefits, electronic publishing has led to several new challenges. Papers of potential interest are now spread across an enormous number of journals, some of which are online-only, open access journals that often have less rigorous peer review and editing than is characteristic of JEB. A section editor of one of these new journals told me that he is required to provide the publisher with a defense of each decision to reject (!), because every additional accepted paper contributes to the publisher's bottom line. Further problems arise from the literature search strategies now common – downloading papers brought to one's attention by an algorithm that 'knows' what matters to you. Looking largely at new papers to which one has been directed by some search algorithm likely minimizes the contact that readers have with what's come to be called the 'front material' of a journal. Here, JEB has been exemplary in developing new categories of articles (Inside JEB, Outside JEB, Commentaries, JEB Classics, Conversations) that broaden a reader's intake of interesting and relevant material. They shouldn't be missed! For me, JEB is something akin to 'one-stop shopping' when combing the new literature. I not only find terrific new research articles that benefit my own research or teaching but also new articles from other journals are also brought to my attention by Outside JEB. The Classics articles are also much appreciated for the historical perspective they provide, showing us the giants on whose shoulders we stand. These Classic articles also show how 'old fashioned' technology, when paired with a creative question, can yield great stories. The diverse Centenary Articles that will be published throughout the coming year will further broaden coverage of the journal's distinguished history and comment on challenges its success has created. The high esteem with which JEB is held by the community has led to an increasingly large flow of manuscripts into the editorial system, as authors strive to have their work published in the most highly regarded outlets. Other essays in the Centenary Articles will touch on these quantitative issues and provide a sense of the scale of effort that is needed in the complicated processes of triage, review and reaching decisions on acceptance or rejection.

### The future: maintaining JEB's core mission while broadening relevance to analysis of 'big' issues

To maintain its stature and importance in the publishing landscape, JEB must retain the great strengths that have characterized its first

century, notably reliance on wise, fair and informed reviewers and editors that ensure that each publication represents an advance to its field. JEB's requirement that each paper tells a novel story has helped it develop its high reputation; this requirement will remain vital, as increasing numbers of journals publish papers with vast amounts of data (think 'omics' here) that often leave the reader confused concerning just what story (if any) these 'cutting edge' data are able to tell.

Papers in JEB may also assume more of a role in 'translational' science, where basic findings are analyzed in the context of a critical issue facing a field or society at large. This role can be played by individual papers and, especially in my view, by the Special Issues of the journal. Since their introduction in 1979, Special Issues have provided sets of concise reviews that encapsulate the status of a field and point to directions that research should take to move the field forward. Certain Special Issues have focused on a particularly challenging problem that research in comparative physiology can help to resolve. The 2021 JEB Special Issue, 'Predicting the Future: Species Survival in a Changing World', is an excellent illustration of the journal's 'translational' function, where mechanistic analysis yields insights into high-level processes such as biogeographical distribution patterns. How the physiological, biochemical and biomechanical systems of animals help adapt or acclimatize them to their environments has been a major historic focus of JEB. This focus now takes on a vastly more significant role as we face a rapidly changing world where organisms confront daunting challenges at all levels of biological organization.

To conclude, if I were to write a concise summary of what JEB does best, I would say that it provides its readers an unequalled understanding of 'how animals work', to borrow the expression made famous by Knut Schmidt-Nielsen in his book by that title (Schmidt-Nielsen, 1972). As stated on the journal's home page, JEB '... is the leading primary research journal in comparative physiology and publishes papers on the form and function of living organisms at all levels of biological organisation, from the molecular and subcellular to the integrated whole animal'. As new methodologies allow biologists to dig deeper and deeper into the 'workings' of animals, JEB will publish increasingly reductionist – yet highly integrative – accounts of what enables animals to do all that they do, under so many environmental conditions. Areas where I see exciting potential for novel multi-level analyses include animal–microbiome interactions (McFall-Ngai, 2015), adaptive editing of RNAs (Rosenthal, 2015) and modulation of environmental effects through alterations in RNA conformation (Somero, 2017). Future discoveries in these and other areas will not only contribute importantly to basic knowledge but also provide the types of sound, mechanistic information that can be used in high-level meta-analyses that provide greatly improved abilities to understand and to predict the consequences of the changing environment we face.

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