

How to build the foundations for a career in fish biology and fisheries

By Stephen Long



Stephen Long spent time on the RV *Paamiut* and witnessed this spectacular view of the northern lights. The vessel is run by the Greenland Institute for Natural Resources. Photo: Mona Fuhrmann.

Stephen Long had support from the FSBI to enable him to attend the *15th Deep-Sea Biology Symposium*, in Monterey, California. This triennial event, held by the Deep-Sea Biology Society, brings together researchers exploring the murky depths. Stephen sent some inspirational photos and his work captures some of the challenges

and fascinations of field work on a grand scale. Because of this his report below is supplemented by further details of the organisations funding his work and of Stephen's career so far. His story is an exciting exemplar of how to grab opportunities and lay the foundations for an interesting career that contributes towards the way we understand a remote part

of our planet.

Stephen reports that his PhD addresses the impacts of demersal trawling on deep-sea benthic ecosystems in the Davis Strait, by deploying a low-cost (GoPro) camera sled across a spectrum of Greenland halibut fishing effort. The conference he attended allowed him to showcase new imagery from a

◀ previously unseen area, with a talk and a poster. He described at the conference how this budget friendly approach yields high-resolution imagery from depths down to 1,500m, identifying vulnerable marine ecosystem (VME) indicator species, estimating mega-fauna abundance and quantifying trawling impacts. He also contributed to a second poster describing the Zoological Society of London's deep-sea science communication efforts from this year, including events, a virtual reality video and the development of a game.

Stephen reports that giving a talk was a valuable (if nerve-

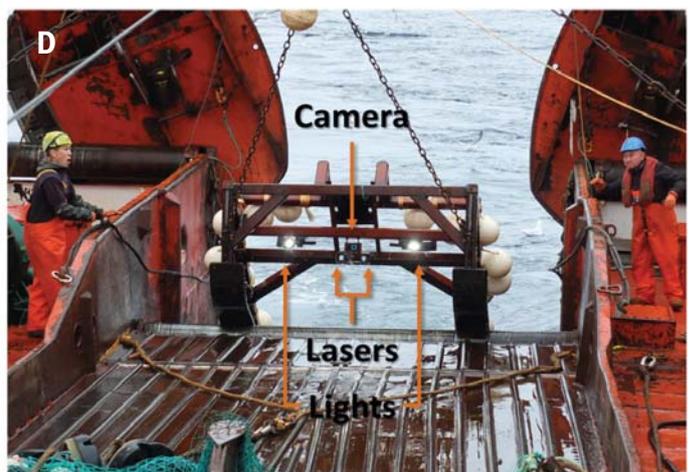
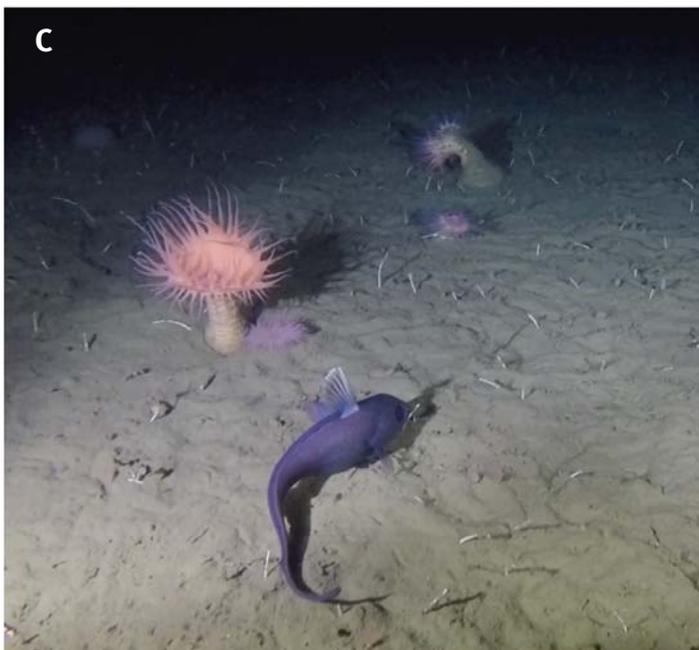
wracking) experience, but for him the best part of the conference was listening to other people and finding out about their research. This furthered his ideas to employ machine learning approaches to image classification. It has also led to potential new research cruise collaboration and greatly expanded his network, one of the main values of a conference. Before the conference began he attended a meeting of the Deep-Ocean Stewardship Initiative (DOSI), where he contributed to the Fisheries Working Group. Subsequently, he has been engaged in a DOSI group starting to address a number of questions

concerning how to apply UN-FAO guidelines on vulnerable marine ecosystems (VMEs) to images.

Stephen comments that this conference was a great experience, taking his research in new directions, establishing collaborations and widening his involvement in the deep-sea world. None of this would have been possible without the support of the FSBI, to whom he is very grateful.

To elaborate on Stephen's project

Stephen's PhD is part of an ongoing collaboration between the Greenland Institute for Natural



Legend to pictures. **A.** Stephen Long on the RV *Paamiut*. **B.** Stephen with a Greenland halibut. **C.** A grenadier fish at 870m depth. **D.** The sledge with camera and lights being launched off the stern of the RV *Paamiut*. **E.** RV *Paamiut* moving through icebergs. **F.** A coral and sponge garden at 550m.



Resources (GNIR) and the Institute of Zoology (IoZ) at the Zoological Society of London (ZSL). The project is currently funded by an IUCN BEST 2.0 grant, with support from ZSL partner, Sustainable Fisheries Greenland (SFG). Stephen himself is funded by NERC through the London NERC Doctoral Training Partnership.

The IUCN BEST programme is part of the EU's *Biodiversity for Life scheme*. BEST is an acronym with a rather contrived expansion, which is Voluntary scheme for **B**iodiversity and **E**cosystem **S**ervices in **T**erritories of Europe overseas. The objective is to promote the conservation of biodiversity and sustainable use of ecosystem services, including ecosystem-based approaches to climate change adaptation and mitigation, as a basis for sustainable development in the EU Overseas Countries and Territories. The scheme funds biodiversity research in the South Pacific, particularly island states, the Indian Ocean, the Caribbean, Polar and sub-Polar areas (hence Greenland in the case of Stephen's project) and the South Atlantic.

Stephen has sent a number of dramatic photographs from his field work which are included here.

Build up to a PhD

For the current generation of doctoral students, the path to a career in research or academia is so much more complicated than

it was forty or fifty years ago. Even before that people like Sidney Holt and Ray Beverton, two of the giants of fisheries science, went straight into research from an undergraduate degree, no PhD required. Now it is becoming the norm that people do a masters degree then a PhD. Gaining experience in other areas of life are also becoming more important for anyone competing for postdocs or relatively permanent jobs. Gaining that experience often requires considerable sacrifice either financial or in terms of the places one is prepared to work.

Stephen Long exemplifies the career route that is becoming more and more common although for each individual the route taken will be unique. After his degree at Durham University, Stephen did a masters at Exeter but then went off to Madagascar. It was here that he worked on a FAO project to establish community-based, sustainable lobster fishery management, including the introduction of periodic no take zones. This led to further small-scale fisheries research in Madagascar, yielding two papers giving Stephen an excellent advantage when applying for the next stage of his career progression. Stephen continues to work with SEED Madagascar in a consultant capacity through a Darwin Initiative project to refine and scale-up the lobster fishery management model.

The FSBI has been funding PhD studentships for at least 15 years and the recent introduction of the internship system has moved the support the Society offers one stage earlier to undergraduates who might consider a career in fish biology. The Society's PhD programme expects the prospective student to create their own projects and this is sometimes challenging for people who have little life experience. The path followed by Stephen, although he is not an FSBI student, illustrates the length young people have to go to these days to gain the experience that gives them the competitive edge allowing them to enter our field.

Based on Stephen's travel grant report but with additions by the editor.

Editorial

In September I attended the International Council for the Exploration of the Sea (ICES) Annual Science Conference (ASC) in Hamburg, Germany. I have been attending the ASC on and off since 2000 and it is interesting to observe the shift in emphasis as shown by the choice of theme sessions. There has been a gradual increase in interest in socio-economic factors in fisheries management. Whereas in the early days of fisheries management the emphasis was very much on the biological basis of fisheries with studies of growth, mortality rates and population dynamics in general, there is now much more emphasis on how management can be structured to achieve sustainable exploitation. In Hamburg the biggest theme session, measured in terms of the number of contributions and

the size of audience was entitled *Towards a better understanding of human behaviour for improved fisheries science and management* convened by Melania Borit (Norway), Bruce Edmunds (UK) and Marloes Kraan (The Netherlands). There was also an excellent keynote talk by Ingrid van Putten of CSIRO Fisheries and Oceans, Australia, on *Unexpected outcomes and unpredictable managers, fishers, and scientists*, which focused on the underlying aspects of human behaviour that have important influences on how fishers respond to management measures. Together with Sarah Kraak from the Thünen Institute, I gave a talk about how the application of findings from behavioural economics can be used to design management measures for sustainable fisheries that take account of the way people actually behave. Sarah and I have spent all or parts of our careers as behavioural ecologists and find that there is considerable crossover between

it and behavioural economics. The FSBI has had a significant influence on the application of behavioural economic ideas into fisheries management through its sponsorship in 2014, together with ICES, of a workshop instigated by Sarah Kraak and Ciaran Kelly on *Insights from Behavioural Economics to improve Fisheries Management*.

Ingrid van Putten's talk can be watched at <https://www.youtube.com/watch?v=ZpWNDeD9gmA&t=1108s>. The report of the 2014 workshop can be found at https://www.researchgate.net/publication/298785507_Report_of_the_Workshop_Insights_from_Behavioural_Economics_to_improve_Fisheries_Management_jointly_funded_by_ICES_and_FSBI_21-23_October_2014_Copenhagen_Denmark

Paul J B Hart
Leicester, November 2018

Next deadline: 1st February 2019

Travel Reports

Rachel Paterson from the School of Life Sciences, Cardiff University, was funded by the FSBI to attend the 9th International Charr Symposium (18-23 June 2018), Duluth, Minnesota, USA. <http://charr.glfsc.org/#home>

Using a Travel Grant from the FSBI, I attended the 8th International Charr Symposium (Duluth, Minnesota, USA) in June 2018. This meeting brought together world leading *Salvelinus* experts to discuss the major challenges facing charr populations including climate change, invasive species impacts and sustainable management. I participated in the 'Parasites and Predators' session presenting my current Sêr Cymru II – Marie Curie fellowship research investigating the effects of multiple stressors on European Arctic charr – parasite assemblages. I also presented a new study demonstrating how local climate gradients may constrain both the trophic niche and parasite communities of sympatric charr and brown trout populations. I appreciate the FSBI's support in

providing me with the opportunity to interact with the charr research community, and I found this meeting to be an excellent platform for developing new collaborations with other charr researchers. I was particularly impressed with the quality of presentations by the early career researchers, such as University of Tromsø MSc graduate Paolo Moccetti's work on trophic niche evolution patterns in polymorphic charr populations, which demonstrated the excellent research coming from the next generation of fish biologists. There were a number of other meeting highlights, including the field trip to the Iron River Hatchery - a US Fish and Wildlife Service operated hatchery responsible for reintroducing lake trout *Salvelinus namaycush* to the Great Lakes, and Duluth City Mayor Emily Larson's declaration of 18 June 2018 as the International Charr Day. For anyone interested in learning more about this meeting, keynote presentations are available at <http://charr.glfsc.org/#streaming>.

Matthew Cobain, from the Southampton University marine Isotopes and Ecology Section, used an FSBI Travel Grant to present work conducted during my PhD at the IsoEcol conference in Viña del Mar. He gave both an oral and poster presentation.

The grant supported me to present my PhD research at the only major international conference on the application of stable isotopes in ecological research. I was accepted to give two presentations. Firstly a poster on my theoretical work on the geometric properties of isotopic niches and an oral presentation on my work quantifying monthly resolution temporal dynamics of stable isotopes in an entire fish community. Both presentations were well received by scientists at all stages in their careers and I was awarded the second best student oral presentation prize.

Attending the conference provided me with a great platform to present my isotopic work to relevant researchers in the field, ➤

◀ which until IsoEcol had been limited to my immediate contacts. This was my first experience of showing my isotopic research to a wider audience. The presentations have greatly facilitated my network development, having been

introduced to several researchers and holding several discussions on limitations in the application of isotopes. Post presentations, I had several conversations regarding potential research collaborations after my PhD, which would have

been impossible without attending IsoEcol, and has provided me with confidence going into a career as a researcher. I greatly appreciate and very much thank FSBI for their generous support.

President's Piece – Winter 2018

As the days shorten and we gradually lose the splendid autumnal colours from the trees, it is conventional to begin to reflect on the past year, and it has been another really full one for the FSBI.

This year saw a major transition in the leadership of our *Journal*, as Tony Farrell took over the reins from John Craig, but it is testimony to both incoming and outgoing Editors-in-Chief and the editorial team that the production of excellent content has continued more or less uninterrupted. I am also a big fan of the new look of the *Journal*, and I was delighted to see my copy of the July 2018 issue drop through my letterbox in its glorious larger format, in full colour and with an eye-catching cover image. I keep a close eye on comments posted on Twitter and other social media, and it seems to me that there is overwhelming support for the new look and feel of the *Journal*, which is really gratifying. I mentioned in my last President's Piece that we were in the final stages of re-negotiating our contract with Wiley over publication of the *Journal*, and am delighted to let you know that this contract has now been agreed and signed. The contract will help the *Journal* to develop still further, and guarantees the financial status of the Society until 2025, allowing us to maintain the support we provide for research and researchers at all levels in the fields of fish biology and fisheries science.

By the time you read this, the FSBI's new website will have been launched. This has been a major project that has occupied a significant amount of time this year, and – as appears to be common with such projects – our initial plans to launch early were somewhat

delayed; rebuilding the site from scratch has proven to be a bigger job than we originally anticipated, and our desire to include a 'Members' login' section, which would allow members of the Society to gain direct access to the *Journal of Fish Biology* content and our funding schemes, meant that we had to jump through a number of other hoops related to GDPR. We are really pleased, though, with the final product and hope that you agree the new website is cleaner, more functional and provides a more logical and streamlined interface for the Society than its predecessor. The 'under the hood' changes also mean that the site is more sustainable over the longer term, and can be edited far more easily by the Society than previously, which will help us keep it up to date, fresh and accurate.

One unfortunate consequence of the delay to 'going live' with the website, is that we are now later than we would normally expect to be in terms of advertising our Annual Symposium, but just to bring to your attention that this exciting event –

which will be held at the University of Hull from 15th-19th August 2019 on the many applications of eDNA in fish and fisheries science – is now open for the submission of abstracts (<https://fsbi.org.uk/annual-symposia/symposium-2019/>).

In December, Council will meet in London to discuss a wide range of topics that are of pressing importance. It will be an historic meeting, in that it will be the first one at which we welcome a student member of our Society. After being granted the authority by the membership to change our constitution to allow this important development, we elected our first student member – Nick Jones (who is studying for a PhD at St Andrews) – at the AGM in the Summer. I think this is a really important step for the Society, and one that will allow us to gain a broader range of perspectives on our work, goals and ambitions for the future.

With all my best wishes, and greetings for the forthcoming festive season.

Iain Barber



Arctic Charr in the Lochs of Scotland: An assessment of distribution and status

By P. S. Maitland & C. E. Adams. 382 pp. Published by Fast-Print Publishing, Peterborough, U.K., 2018. Price £42.95. ISBN: 978-1-78456-477-3



I must start my review of this book by declaring that its publication was supported by sponsorship from the Fisheries Society of the British Isles (FSBI), i.e. the owners of this journal, and that I have worked with its authors for many years. However, I consider that I am still able to give an objective review of this book in what is a somewhat specialised area of fish biology with relatively few alternative reviewers.

Given that many of Scotland's Arctic charr populations have never been subjected to scientific study (the authors report that only 112 sites have been investigated in this way), it is to the authors' great credit that this substantial book runs to 382 very informative pages. This remarkable collation of information has been achieved by drawing on many sources from the non-scientific literature, but more on that later. The book is structured as 10 chapters, supported by a bibliography worth its weight in gold and a thorough index which is dominated, unsurprisingly, by the lochs containing or having once contained Arctic charr populations. The text is supported by a liberal sprinkling of high quality figures, many of which are colour photographs of individual Arctic charr and their sites.

Chapter 1 introduces the reader to the Arctic charr through an expected review of its general biology supported by a discussion of its arrival in what was to become Scotland and other aspects of

relevant research. Chapter 2 presents the information sources used during the book's writing, with Chapter 3 calling on this information to consider the history of Arctic charr records in Scotland from the 17th to the 20th centuries. General aspects of the distribution of this species are then described at length in Chapter 4 where the authors report that of the 295 sites with records, 141 of these have robust and recent records and so are considered to be extant. A further 44 sites with less robust data are considered to be probably extant. The authors also identify a further seven sites from which Arctic charr are now extinct and a further two sites where they are presumed extinct. An additional 32 putative sites are presented for which existing records are poor, but where the species is likely to exist, with a further three sites considered as doubtful. Nevertheless, the authors contend that there are likely to be considerably more populations awaiting discovery and present an interesting distribution modelling exercise which suggests that the total number of lochs supporting Arctic charr populations in Scotland may be as high as 671. The chapter goes on to review introductions of Arctic charr, before Chapter 5 considers Arctic charr ecology with a particular emphasis on reproduction. Chapters 6, 7, 8 and 9 then cover variation, exploitation, factors affecting populations, and conservation, respectively. The

major part of the book is presented in Chapter 10 which assembles detailed records of Arctic charr occurrences on a loch by loch basis organised into hydrometric areas.

Chapter 10 is the strength of this book and is a masterpiece of information collation and organisation. Each loch is presented with information on its morphology, chemistry, fish community, Arctic charr population status and a sensitivity score, supported by additional notes which for some sites are considerable. In a world where one can now make digital searches of vast amounts of online data, the wealth of information presented here from records collated in large part from pre-digital times is so impressive and few individuals are likely to possess or to have access to the required hard copy literature. This is fantastic work and a real service to anyone involved in research on or the management of Arctic charr in Scotland, while also providing an example to the rest of the world of just what can be done in terms of collating existing information on this remarkable fish.

This is a fantastic book and one which has more than repaid the investment of FSBI's sponsorship. Indeed, without such a grant it is unlikely that this book would ever have been produced because it is unlikely to be commercially viable. Its market is necessarily limited to those relatively few individuals involved in field research on or the conservation management of this remarkable species, but if you are active in either of these areas this book is a fantastic resource. I wish that it had existed back in the early 1990s when I first entered this area!

Ian J. Winfield
Centre for Ecology & Hydrology,
Lancaster, U.K.

Fresh from the Press: News on your Journal



The *Journal of Fish Biology* is an integral part of the *Fisheries Society of the British Isles* and I am its new Editor-in-Chief (EiC). Therefore, I hope to keep you up to date with 'Journal happenings' through regular contributions to this Newsletter. So, this is the first of many to come!

My most important task is to thank Dr. John Craig for his sterling leadership of the *Journal of Fish Biology* for almost 20 years. I have been a part of the Editorial Team for this entire period. Not only have I enjoyed working with John, I have greatly appreciated the quality control that he maintained throughout his leadership. Also, I have contributed over 30 works to its content. The *Journal of Fish Biology* is a solid journal.

I thought it would be good to start by briefly introducing myself. I grew up in the heart of the Black Country – Wolverhampton. I obtained a B.Sc. honours degree in Biology at Bath University (Drs. Lutz, Potter and Hardisty were some of my professors). I then moved to Canada where I obtained my Ph.D. in Zoology at the University of British Columbia, supervised by Dr. David Randall. I was a professor at Mount Allison University and then Simon Fraser University. I currently hold a Canada Research Chair (Tier I) at the University of British Columbia.

Before taking on the EiC role for the *Journal of Fish Biology* in January 2018, I had had a wide variety of experiences with scientific publishing. Foremost, I was an Assistant Editor for the *Journal of Fish Biology* for nearly 20 years. Also, I have served of the editorial teams for *Aquaculture*, the *Canadian Journal of Zoology*, *Physiological and Biochemical Zoology*, and the *American Journal of Physiology*. I have co-edited over 25 volumes of the treatise *Fish Physiology* and I was EiC for the *Encyclopedia of Fish Physiology: From Genome to Environment*. I have been generously rewarded for my scientific endeavours: I have received the Beverton Medal

from the FSBI, the Fry Medal (the highest honour to a scientist from the *Canadian Society of Zoologists*) and the Medal of Excellence (the highest honour to a scientist from the *American Fisheries Society*). I am a Fellow of the *Royal Society of Canada*.

In closing, here are a few of the changes coming to the *Journal of Fish Biology*. You may have already noticed some of them in of the July issue, which unfortunately was a tad late getting published. The layout style for the journal has changed completely. In addition, all colour figures are now published free of charge. Also, we are highlighting papers in each issue with a new feature called *Between JFB's Covers*. Lastly, there is another new feature called *Opinions* that I hope will become a 'must read' for all members. Please check out the July issue for the first of these *Opinions* - the invasion of Pacific pink salmon into European rivers. Perhaps some of you have an opinion to express on a hot topic. If you do, drop me an email.

Tony Farrell, Editor-in-Chief for *Journal of Fish Biology*
Vancouver, BC, Canada
September 2018

Notices

Net your idea for World Fisheries Congress 2020

The next World Fisheries Congress is only two years away.

Adelaide, Australia will host the premier international fisheries conference in 2020 bringing together research, industry, management and the latest technological advances in fisheries worldwide under the theme 'Sharing our oceans and rivers – a vision for the world's fisheries'.

Aiming to foster cooperation and engagement in commercial, recreational and indigenous fisheries, the World Fisheries Congress 2020 (WFC2020) will provide insightful presentations and inspiring forums on key developments needed to ensure future sustainable development of the world's oceans, lakes, estuaries and rivers.

Organisers of this major event are now seeking expressions of interest to lead innovative



◀ sessions, symposia and education and training workshops.

Chair WFC2020 Gavin Begg, who is also the Research Director of Aquatic Sciences at the South Australian Research and Development Institute (SARDI) said excitement for the congress was building.

“We’re thrilled to have so many world leaders in fisheries science, management and industry converge in Australia at the same time,” he said.

“We are currently seeking expressions of interest for key components of the program, so if you have a key topic or theme you’d like to lead, get in now and register it.

“The program is shaping up to be very comprehensive, with something for every delegate to take away and learn from.”

Help set the future directions for the world’s fisheries and lead in these critical discussions by emailing your ideas or suggestions to conference@aomevents.com by 31 January 2019 (extended deadline).

Sponsors and exhibitors won’t want to miss out either. Showcase your business on the world fisheries stage by sponsoring or exhibiting at WFC2020.

With more than 1500 attendees; multiple networking events; maximum opportunity to engage with major purchasers of scientific, fishing and aquaculture equipment; and dedicated media coverage this event is much anticipated across the globe.

Save the date – the Congress will be held in Adelaide from 11 to 15 October 2020.

Find out more at www.wfc2020.com.au/sponsors/

The World Council of Fisheries Societies, including the Australian Society for Fish Biology is proud to support the 8th World Fisheries Congress in Adelaide, 2020. The Congress is supported by foundation sponsors the South Australian Government and FRDC on behalf of the Australian Government.

ANNOUNCEMENT FSBI SYMPOSIUM 2019



Advances in eDNA-based Approaches to Fish Ecology and Management

University of Hull, UK, 15-19 July 2019

Scientific Advisory Committee: Bernd Härting (UK, Convenor); Lori Lawson Handley (UK, Co-Convenor); Stefano Mariani (UK); Kerry Walsh (UK); Neil Gemmill (NZ); Jens Carlsson (IRE); Florian Leese (GER); Ian Winfield (UK)

- Fisheries and conservation issues in freshwater and marine fish communities
- Monitoring and predicting the spread and impact of invasive fish
- Molecular food webs and trophic interaction
- Fish pathogen and parasite detection
- The dynamics and ecology of fish eDNA in the environment
- Methodological advances, incl. metagenomics, population level analysis, new technologies
- eDNA based monitoring and translation into policies



Information Desk

For all membership enquires (except subscription payments), including grant application submissions, please contact the FSBI office at:

FSBI, c/o Charity & Social Enterprise Department, Brabners, Horton House, Exchange Flags, Liverpool L2 3YL, UK

Contact: Shirley Robinson

Phone: +44 (0) 151 600 3362

Email Enquiries: grants@fsbi.org.uk

In the UK and Europe subscription enquiries should be addressed to:

admin@fsbi.org.uk Charities and Social Enterprise Department, Brabners, Chaffe Street, Horton House, Exchange Flags, Liverpool L2 3YL

Tel: 0151 600 3000 (ext. 3362)

Fax: 0151 227 3185

See <http://www.fsbi.org.uk/membership/joining-the-fsbi/> for further information.

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