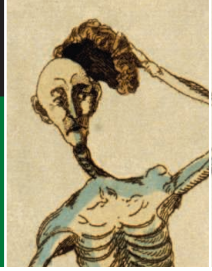


LETTERS

edited by Jennifer Sills

Postdocs: The Power of Unions

AS A POSTDOC AT THE UNIVERSITY OF CALIFORNIA–SANTA CRUZ AND PRESIDENT OF UAW LOCAL 5810, the union that represents over 6000 postdocs at the University of California, I read with interest A. I. Leshner's Editorial on the need for a broad-scale effort to standardize and improve the postdoc experience ("Standards for postdoc training," 20 April, p. 276). Leshner is right that many postdocs face numerous challenges, including limited job security, varying benefits, visa and immigration issues, and pay that fails to reflect our contributions.

To address these issues, Leshner unfortunately fails to recognize how the voice of postdocs themselves—through the democratic process of collective bargaining—can play a critical role. The contract that the UAW has negotiated with the University of California includes a minimum salary scale that matches the NIH/NRSA scale, a stable and comprehensive benefits plan, more job security, and the right to career development resources. With the increases we've won in paid time off, female postdocs no longer have to face uncertain maternity leave. And when work-related issues arise, there is an impartial process for resolving them.

In addition, being part of the UAW gives postdocs a more powerful voice and more political strength to advocate for issues such as science funding, progressive immigration reform, and gender equality in the academy.

When postdocs have an equal say in determining our working conditions, our quality of life improves, which in turn improves the quality of research. Our union welcomes the opportunity to work with the Committee on Science, Engineering, and Public Policy (COSEPUP) and all other interested parties for the good of postdocs and for the good of society.

NEAL SWEENEY

Department of Molecular, Cell and Developmental Biology, University of California-Santa Cruz, Santa Cruz, CA 95064, USA; UAW Local 5810, Berkeley, CA 94704, USA. E-mail: president@uaw5810.org

Speaking with one voice. Postdoc unions can negotiate better benefits for their members.

Postdocs: NPA's Success

THE NATIONAL POSTDOCTORAL ASSOCIATION (NPA) applauds the recent Editorial by A. I. Leshner calling for the scientific community to commit to providing quality postdoctoral experiences ("Standards for postdoc training," 20 April, p. 276). The NPA is ideally positioned to take up Leshner's call to action: In its first decade of existence, the NPA has laid the groundwork for the standards, norms, and expectations required to deliver an optimal postdoctoral experience.

The NPA's Recommendations for Postdoctoral Policies and Practices (*1*) have been adopted widely by research institutions and funding agencies. Due in large part to the NPA's efforts, the number of postdoc offices on record has increased from less than 25 in 2001 to more than 135 today. The NPA provides online toolkits and conducts site visits to help institutions establish postdoc offices as well as postdoc associations. In answer to Leshner's call to action, the NPA Board of Directors has undertaken an initiative to develop a national certification program to recognize institutions that are implementing best practices for supporting the postdoc experience. The NPA's track record, expertise in postdoctoral matters, and established support base place it years ahead of any alternative organization that might take on this challenge. We look forward to engaging the research community at all levels as we develop this program.

LORRAINE TRACEY,* MAHADEO SUKHAI, STACY L. GELHAUS, DAVID TAYLOR

NPA Board of Directors, National Postdoctoral Association, Washington, DC 20005, USA.

*To whom correspondence should be addressed. E-mail: Lorraine@nationalpostdoc.org

Reference

1. NPA, NPA Recommendations for Postdoctoral Policies and Practices (www.nationalpostdoc.org/recommendations).

Turing in Context

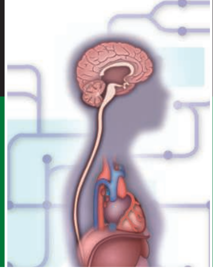
IN HIS PERSPECTIVE "BEYOND TURING'S machines" (13 April, p. 163), A. Hodges claims that in 1945 Turing "used his wartime technological knowledge to design a first digital computer." He also suggests that Turing's work of 1936 laid the foundation for encoding "all known processes," going "far beyond the vision of others at the time." These statements implicitly diminish the earlier work of Kurt Gödel and Konrad Zuse. In 1931, Gödel used the integers to design a universal language capable of encoding arbitrary computations and general algorithms that could prove theorems (*1*). This allowed him to identify the fundamental limits of math and provability. Turing and his adviser Alonzo Church later merely reformulated Gödel's work in an elegant way. Furthermore, Zuse's 1936 patent application Z23139/GMD Nr. 005/021 already described a concrete general computer, as opposed to a purely mathematical construct. By 1941, Zuse had physically built the first working universal digital machine, years ahead of anybody else [e.g., (*2*, *3*)]. Thus, unlike Turing, he not only had

CREDIT: ISTOCKPHOTO.COM

Published by AAAS

Fungal evolution

1649



Metabolism, redux

1651

a theoretical model but actual working hardware. Future hardware leader IBM was well aware of Zuse's breakthroughs and acquired an option on his patents at the earliest possible point after the war (*4*). The great computer science hero Turing surely deserves center stage on his centenary. But let's not exaggerate his achievements at the expense of others!

JÜRGEN SCHMIDHUBER

The Swiss AI Lab IDSIA, Galleria 1, 6928 Manno-Lugano, Switzerland. E-mail: juergen@idsia.ch

References

1. K. Gödel, *Monatsh. Math.* **38**, 173 (1931).
2. R. Rojas, *IEEE Ann. History Comput*. **19**, 5 (1997).
3. Konrad Zuse Internet Archive (www.zib.de/zuse/home.php).
4. IEEE Global History Network, Konrad Zuse: An Interview Conducted by Frederik Nebeker, IEEE Center for the History of Electrical Engineering (28 August 1994); www.ieeeghn.org/wiki/index.php/Oral-History:Konrad_Zuse.

Response

IN 1936, TURING DID FOLLOW GÖDEL'S 1931 revolution in logic. His first citation was to Gödel, and he described his mathematical argument as similar to Gödel's. But Turing successfully addressed Hilbert's question of decidability, a problem that Gödel's work had not settled. He did so based on an entirely original philosophical analysis of the concept of computing (which was in no way advised by Church).

Turing's 1936 work also introduced the concept of the universal machine, and this, rather than Gödel's work, provided the theoretical basis of the modern computer. In doing so, Turing introduced the concept that computation could act on general symbolic, not necessarily arithmetical, structures. In particular, he exploited the fact that a program is itself such a structure. It was on the basis of this deep understanding that in 1945 Turing could write the detailed plan and prospectus for what he called the practical version of his universal machine. It is a telling fact that in recent discussions of whether Zuse's machines (or indeed Babbage's Analytical Engine) were truly general-purpose, the criterion adopted is whether they can simulate any Turing machine (*1*). This is because Turing's definition of computability sets the definitive standard. In contrast, there is no need for such a discussion of how Turing's own plans embodied his theory.

Turing illustrated universality with examples from mathematical physics, algebra, and data processing, but also from non-numerical cryptology and chess-playing. Most strikingly, he emphasized that programs could be written in a user-friendly form, with the computer itself used to translate them into machine code. This all-encompassing and farsighted vision also led him into investigating the prospects for simulating the human brain by computable processes.

Many great figures—Gödel, Babbage, Church, von Neumann, and Shannon, to name just a few—populated the landscape in which Turing made his contributions. But Turing had a distinctive place connecting theory to practice and logic to physics.

ANDREW HODGES

Wadham College, University of Oxford, Oxford, OX1 3PN, UK. E-mail: andrew.hodges@wadh.ox.ac.uk

Reference

1. R. Rojas, "How to make Zuse's Z3 a universal computer" (www.zib.de/zuse/Inhalt/Kommentare/Html/0684/universal2.html).

TECHNICAL COMMENT ABSTRACTS

Comment on "Global Correlations in Tropical Tree Species Richness and Abundance Reject Neutrality"

Rampal S. Etienne and James Rosindell

Ricklefs and Renner (Reports, 27 January 2012, p. 464) showed correlations of species richness and individual abundance within families across continents and claimed that neutral theory predicts no such correlation. However, they did not substantiate this claim quantitatively with a neutral model. Here, we show that neutral theory can be consistent with these correlations and, consequently, that the correlations alone cannot reject neutrality.

Full text at www.sciencemag.org/cgi/content/full/336/6089/1639-b

Comment on "Global Correlations in Tropical Tree Species Richness and Abundance Reject Neutrality"

Camilo Mora

Ricklefs and Renner (Reports, 27 January 2012, p. 464) suggested that strong correlations in the diversity of shared families between isolated tree assemblages reject neutrality. Simulations of a neutral model indicate, however, that isolated assemblages under various configurations of random speciation and extinction do sustain strong correlations in the diversity of shared families. Thus, reported correlations support rather than reject neutral theory.

Full text at www.sciencemag.org/cgi/content/full/336/6089/1639-c

Comment on "Global Correlations in Tropical Tree Species Richness and Abundance Reject Neutrality"

Anping Chen, Shaopeng Wang, Stephen W. Pacala

Ricklefs and Renner (Reports, 27 January 2012, p. 464) found significant correlations for abundances and species diversities of families and orders of trees on different continents, which they suggested falsifies the neutral theory of biodiversity (NTB). We argue that the correlations among families and orders and the lack of correlations among genera can be explained by the NTB.

Full text at www.sciencemag.org/cgi/content/full/336/6089/1639-d

Comment on "Global Correlations in Tropical Tree Species Richness and Abundance Reject Neutrality"

François Munoz, Pierre Couteron, Stephen P. Hubbell

Ricklefs and Renner (Reports, 27 January 2012, p. 464) have argued that the neutral theory of biodiversity and biogeography cannot explain the correlations in family abundances and species richness found between tropical forests from distinct continents. However, we show that such patterns can arise from neutral processes of diversification, migration, and drift over large spatial and temporal scales.

Full text at www.sciencemag.org/cgi/content/full/336/6089/1639-e

Response to Comments on "Global Correlations in Tropical Tree Species Richness and Abundance Reject Neutrality"

Robert E. Ricklefs and Susanne S. Renner

The neutral models in the Technical Comments depend on the assumption of an initially homogeneous global tropical forest flora. Fossil data and phylogenetic reconstructions instead reveal a high degree of provincialism before the development of modern tropical forests with only occasional long-distance dispersal between continental regions, favoring parallel diversification of a small number of ancestral lineages that dispersed between regions at widely different times.

Full text at www.sciencemag.org/cgi/content/full/336/6089/1639-f