issi newsletter #6
international society for scientometrics and informetrics
quarterly e-zine of the international society for scientometrics and informetrics
vol. 02 / nr. 2
june 2006

EDITORIAL

■ Biologist Rory Wilson proposes a referee factor

Rory Wilson, editor for *Marine Ecology Progress Series*, got frustrated by scientists who themselves publish extensively but refuse to review other people's articles. Given the average rejection rates, and the fact that students cannot be expected to review research papers, all serious scientists should review three to four times as many articles as they themselves submit. According to Wilson - and I fully agree with him - the current system favours those that only take their own career into account. Those who never review have more time to push forward their own research agenda, as seriously reviewing articles is a time-consuming process. Yet, peer review is critical to the advancement of science.

In a correspondence in *Nature* Wilson (2006) proposes the following solution. Journals should at regular intervals (once a year, once every two years) publish on the Web a list of referees, and the number of submissions they have reviewed. Note that, except for the number of submissions reviewed, many journals do this already. When the interval between such publications is long enough anonymity of the peer review process is not at risk. Multiplying the number of reviews with a quality or prestige measure of the journal, e.g. the journal impact factor, yields the proposed referee factor. According to Wilson, such a referee factor could be taken into account in standard

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assessments of performance. In such a way this new performance measure could act as an incentive for people to review manuscripts.

Answering my e-mail enquiry, Wilson told me that his letter in Nature has received widespread support, especially from those colleagues who actually undertake a great deal of reviewing. His feeling is that if journals were to adopt the suggested policy, so that the referee work done were acknowledged for its real worth via the referee factor, a huge injustice in the current system would be addressed.

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Wilson, R. (2006) "Referee factor' would reward a vital contribution. Nature, 441, p. 812.

Ronald Rousseau

AFTER THE JOURNAL IMPACT FACTOR AND THE WEB IMPACT FACTOR A REFEREE FACTOR ENTERS THE FRAY: SOME COMMENTS

In the editorial to this Newsletter I presented the referee factor (Wilson, 2006) as a way to encourage scientists to do their bit in refereeing. In this note I would like to give some comments as an informetrician.

The referee factor of scientist S for the year Y may be defined as

$$\sum_j a_{j,S}(Y) * F_j(Y+d) \qquad (1)$$

Informula (1) $a_{j,S}(Y)$ denotes the number of manuscripts reviewed by scientist S for journal j (as published on the Web) in the year Y. F_j is a quality factor of journal j, and a sum is taken over all journals for which a_j and F_j are available. Note that a delay, denoted as d, could be introduced. The rational for introducing such a delay is that a reviewer should not be gauged by other persons reviewing ability (quality) but, at least partially, by her own. Assume that the standard journal impact factor is taken for F_j, then this impact factor refers to the visibility (impact, quality?) of articles published in years Y-2 and Y-1, which would not really be appropriate. In this case d should preferably be taken equal to two or even three. For e-journals with no publication delays (articles are put online once they are accepted) and with a quality factor F_j referring to download counts, d can be taken equal to zero. In any case: the referee factor for the year Y can only be determined when the F_j-value for the year Y+d is known. Clearly many alternatives exist for the quality factor. Besides a plethora of impact factors (including those based on local databases), also variations on the h-index, download counts, and even indexes derived from field-specific rankings (important in the humanities) may be used.

In theory one could even imagine that the first factor in (1), $a_{j,S}(Y)$, incorporated the amount of work done by the reviewer. The simplest form would be using the number of pages, and not the number of submissions, or the actual time taken to do the review (I have, however, no idea how this could be determined in an objective way).

Could the referee factor be manipulated? Of course: friends of the editor getting preferential treatment springs to mind. It is indeed easy for an editor to send an adequate amount of easy papers to his friends, while other scientists,

perhaps much more qualified, receive just a few, very tough papers to review. Moreover, young scientists, without support of their mentors, would have a hard time in obtaining a referee factor at all. Another possible source of bias could be that the main editor is not considered as a reviewer, because the reviewing he does is of another type; or is considered as a reviewer for each manuscript.

I think that the idea of a referee factor is interesting. It should certainly be tried either as a way to improve peer review, or as another assessment tool for individuals, or both.

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Wilson, R. (2006) "Referee factor would reward a vital contribution. *Nature*, 441, p. 812.

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■ **Nature's peer review debate** – Peer review is commonly accepted as an essential part of scientific publication. But the ways peer review is put into practice vary across journals and disciplines. What is the best method of peer review? Is it truly a value-adding process? What are the ethical concerns? And how can new technology be used to improve traditional models? Each week this Nature web debate will publish analyses and perspectives from leading scientists, publishers and other stakeholders to address these questions. Key links and relevant articles from our archive are listed below, with further resources available through Connotea. Visit the peer review commenting forum to read and post comments on peer review.
See also: http://www.connotea.org/user/Maxine/tag/peer%20review%20debate and http://www.nature.com/nature/peerreview/debate/index.html

THE NEW *JOURNAL OF INFORMETRICS*

by Leo Egghe

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In April 2006, the publisher Elsevier (Oxford, UK) accepted my proposal for the foundation of a new journal in the field of informetrics. The Journal of Informetrics is the first internationally published journal that bears "informetrics" in its name. The abbreviation JOI also expresses my spirit concerning this approval!

This new journal will be launched after several years of investigation of the field of informetrics. It is evident that the major reason for the foundation of this journal is the growth of the field. This growth is caused, mainly, by the vast increase of the ways in which electronic information is created, distributed and used (including e-journals and repositories via the Internet, to mention just two important examples). Together with electronic information, new informetric indicators are created to measure their quantities and use: connect time is replaced by times of connections, citations are complemented by hyperlinks and by downloads, and so on. The need for more publication outlets in informetrics is also apparent by the expansion of the journals Scientometrics and Journal of the American Society for Information Science and Technology (JASIST). The former increased its number of issues from 9 to 12 issues per year, from 2005 onwards; the latter increased from 12 to 14 issues per year in 1998. Other evidence for the increase of the field of informetrics is described in Egghe (2005) and references therein.

Another reason for the increasing "popularity" of informetrics is its growing interdisciplinarity. Informetrics not only comprises the more classical fields of bibliometrics (metrics of libraries, bibliographies, ...) and scientometrics (citation

analysis and its applications), but also (as mentioned above) network studies, generalizing citation networks to general networks such as Internet, intranets, collaboration networks, in short: social networks. This attracts scientists from fields such as mathematics, physics and computer sciences, thereby considerably increasing the number of researchers engaged in informetrics.

The new journal complements existing journals in the field in a number of ways. For example, JASIST is a general information science journal with interest in informetrics publishing many general papers or technical papers on information science which are not really in the quantitative (informetrics) area. The journal Scientometrics certainly publishes papers in the informetrics field but, in principle, it restricts its attention to applications of citation analysis. It also publishes many "case studies". The journal Information Processing and Management (IPM) (also published by Elsevier) occasionally published papers on informetrics but the majority of papers is on theoretical aspects of information retrieval (IR). Although quantitative aspects of IR belong to the scope of JOI, the overlap of JOI with IPM will be minimal. Further, the publications Journal of Documentation and Journal of Information Science only exceptionally publish informetrics papers (which are exclusively non-technical in nature).

JOI is a journal with a broad spectrum of informetric topics: all quantitative aspects of information are included within the journal's scope. Of course, as for any peer-reviewed journal, there are the limitations to high-quality papers. Such papers can be described as articles containing mathematical-probabilistic-statistical models and/or containing a good description of universally interesting data-sets. The scope can be illustrated by the papers published in IPM in two special issues on informetrics in 2005 (V41/No.6 http://www.sciencedirect.com/science/journal/03064573) and 2006 (currently in press), for which I was the guest editor.

JOI will be a quarterly journal, each issue comprising about 100 pages. The first volume of JOI will be published in 2007. However it is the intention to have the printed and electronic version of the first issue ready by December 2006. This means that the editorial office should have the first issue ready by end of September.

You are hereby invited to submit a paper for JOI. Submission must be done using Elsevier's ees (electronic editorial system). Author guidelines will be available shortly, and papers may be submitted via Elsevier's web-based editorial system. In the meantime, if you have any questions regarding the suitability of your paper, please contact me directly (leo.egghe@uhasselt.be).

Prof. Dr. Leo Egghe
Editor-in-Chief,
Journal of Informetrics

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Egghe, L. (2005). Expansion of the field of informetrics: origins and consequences. *Information Processing and Management* 41(6), 1311-1316.

The World of Science: Interesting Figures

There are about six million readers of scientific articles worldwide.
About 21,000 refereed scholarly journals are available on the market.
These journals publish about 1,200,000 articles a year.
These articles are written by about 1,900,000 unique authors.

From these data it can be derived that on average a reader becomes a writer of 0.2 articles a year, while an 'active' author writes on average 0.63 articles a year (counted fractionally). As Mabe & Amin (2002) estimate this number (for SCI papers only) at 0.80 in 1998, with a decreasing trend over the years, the value of 0.63 seems to be somewhat low, yet still acceptable.

Data come from Ulrich's periodical directory, and the number of articles and authors in journals covered by ISI, extrapolated to all journals. Note that it is notoriously difficult to estimate the numbers presented above. Hence I introduce a note of caution with respect to the absolute validity of these numbers. I believe though that they offer a reasonable approximation and are interesting enough to be published in our Newsletter.

Reported by Ronald Rousseau with contributions of Chris Pringle and David Tempest from Elsevier (UK). Mabe M.A. & Amin, M. (2002). Dr Jekyll and Dr Hyde: author-reader asymmetries in scholarly publishing. Aslib Proceedings, 54(3), 149-157.

Jean-Charles Lamirel:
COLLNET 2007 MEETING REPORT

The 7th COLLNET 2006 meeting took place from 10 to 12 May 2006 in the famous "Institut de l'Information Scientifique et Technique" (INIST) of Nancy, France. This meeting was also funded by the LORIA, which is the most important computer science laboratory of eastern France, and by other important regional actors. It was a renewed opportunity of fruitful exchanges between the members of a very active community of scientometricians issued for the broad world: the meeting included 6 plenary talks and more than 30 papers and posters written by scientometricians and webometricians originated from more than 20 different countries. It highlighted the excellent work of new emerging laboratories like the DUT-Wiselab of China, which is the first Chinese laboratory that received the governmental accreditation to deliver PhD diploma in the domain of Scientometrics. Moreover, it confirmed the main scientific role in the domain of the other countries of eastern world, like India and Iran. One of the specific goals of the Nancy meeting was also to launch cross disciplinary discussions between scientometricians/webometricians and people coming from emerging fields like artificial intelligence, visualization paradigms and xml/metadata engineering. These discussions clearly highlighted that the use of such new techniques not only represents a guaranty for fighting against the usual blocking factors of the domain but also provides a sound basis for enlarging the scale, the granularity and the automatization of the future scientometric and webometric analyses. Another important point was the official presentation of a new 6th European framework proposal of the COLLNET group named: Global Interdisciplinary Research Network for the Study of Aspects of Collaboration in Science and in Technology. The COLLNET group put many hope in this proposal with multiple strategic objectives including the enhancement of collaboration between Europe and developing countries in S&T studies and the promotion of emerging techniques through the direct exchange between senior scientists and the sharing of scientific support and formation of students. The major partners of the proposal are the Humbold University (Germany), the Archimedes foundation (Estonia), the LORIA laboratory (France), the NISTADS (India) and the DUT-Wiselab (China). All the presentation of the 7th COLLNET meeting has been video-recorded by the technical team of INIST and the proceedings will be soon available on-line (see collnet.inist.fr). The upcoming International Forum on Science Study and Scientometrics, organized by DUT-Wiselab on the 24-28 September 2006 in Dalian (www.wiselab.cn), and the 8th COLLNET meeting, organized by NISTADS on 6-9 March 2007 in New Delhi (www.collnet.de), will represent new opportunities to pursue the common goals of the group.

ISSI Newsletter is published by ISSI (http://www.issi-society.info/).
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SCIENTIFIC THINKING IS APPLIED LOGIC, **ISN'T IT**?

by Ronald Rousseau

■ A game

A large group of scientists has gathered in a big room and you are among them. Now everyone is invited to pick a natural number between zero and one hundred (included) and not to tell anyone which number they picked. It is also announced that the person who chose the number nearest to 2/3 of the average of all numbers receives a large amount of money. Which number should you choose?

You may think that all the others are stupid and just pick a random number between 0 and 100. Then the average is 50, so you choose 33. But then you realize that the others are not that stupid and are quite capable of making the same reasoning as you did. Hence they will all pick 33, and hence you pick 22. But then, you realize that the others are scientists and quite capable of making this reasoning too. Hence you pick 15. But then you realize … The logical conclusion is that everyone should pick zero.

Now try this in reality, say with a class of your students. What will happen? Is one class smarter than another? In reality one must try to guess the level of reasoning that the others will apply.

The game described above is known as a "beauty contest" game. The term "beauty contest" is derived from the following version. Assume that people are presented with a set of faces (originally pictures were printed in a newspaper, nowadays probably shown on the Internet) and they are invited to guess which face will receive the most votes. This is: which face others will judge to be the most beautiful. The point is that you are not asked to say which face you think is the most beautiful, but which face will receive the most votes. So, you should not answer if you intend to win the game which face the average opinion will genuinely think to be the prettiest, but what the average opinion expects the average opinion to be the prettiest. Or actually, you have to think further, of course!

■ Game theory and economic behaviour

The game explained in the previous section, and similar strategic games are analyzed by Colin Camerer and his collaborators (Camerer et al, 2004; Camerer & Fehr; 2006). In most theories of economic behaviour one assumes that players think rationally. Yet, in real-world applications, such as the stock market, it is generally observed that players believe that the others will not do as much thinking as they themselves do. Camerer and his collaborators model such games by applying a step-by-step procedure. On level zero nothing is assumed (except maybe a uniform distribution). Level k players, k = 1, 2 … assume that their opponents are distributed according to a normalized Poisson distribution from step 0 to step k-1 players. They ignore the fact that maybe there are other step k players, or even step m players, with m > k. The distribution of players over all steps is assumed to be Poisson in the model used by Camerer. Real-world tests, surprisingly, show that a Poisson distribution with a parameter as low as 1.5 often reliably describes the data. Hence pure or even moderate - logical thinking does not happen in reality.

■ Applications in information science?

I wonder if there are situations in information science where this theory applies. Such situations should include choices and/or preferences. It should also include many players. I have always thought that many theories and approaches applied in economics, and certainly econometrics, are, mutatis mutandis, applicable in the information sciences. Examples are: the Pareto (= Lotka) and Weibull distribution, the Lorenz curve and the Gini index, models for fines (Rousseau & Rousseau, 1999). I even wrote about a future where informetrics would play a major role within the information sciences, in a similar way that econometrics and mathematical modelling play a major role in economics as a whole (Rousseau, 1994).

Searching in a professional database, using specified keywords and codes, might be a good example of the "beauty contest" game in the information science. Indeed, you should not use random words (level zero), nor the words that you think are best suited to describe the topic you are interested in. It is better to use the keywords you think that the indexer would have used. But if this indexer is a clever person he/she might have used the words he/she thought that the general user searching for this topic would use, and, of course, …

I challenge our readers to find more real-world applications of the beauty contest game, and derive another mathematical model describing it, or check the Poisson model proposed by Camerers group. Success!

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C.F. Camerer, TH Ho, and JK Chong (2004). A cognitive hierarchy model of games. *The Quarterly Journal of Economics*, 119, 861-898.

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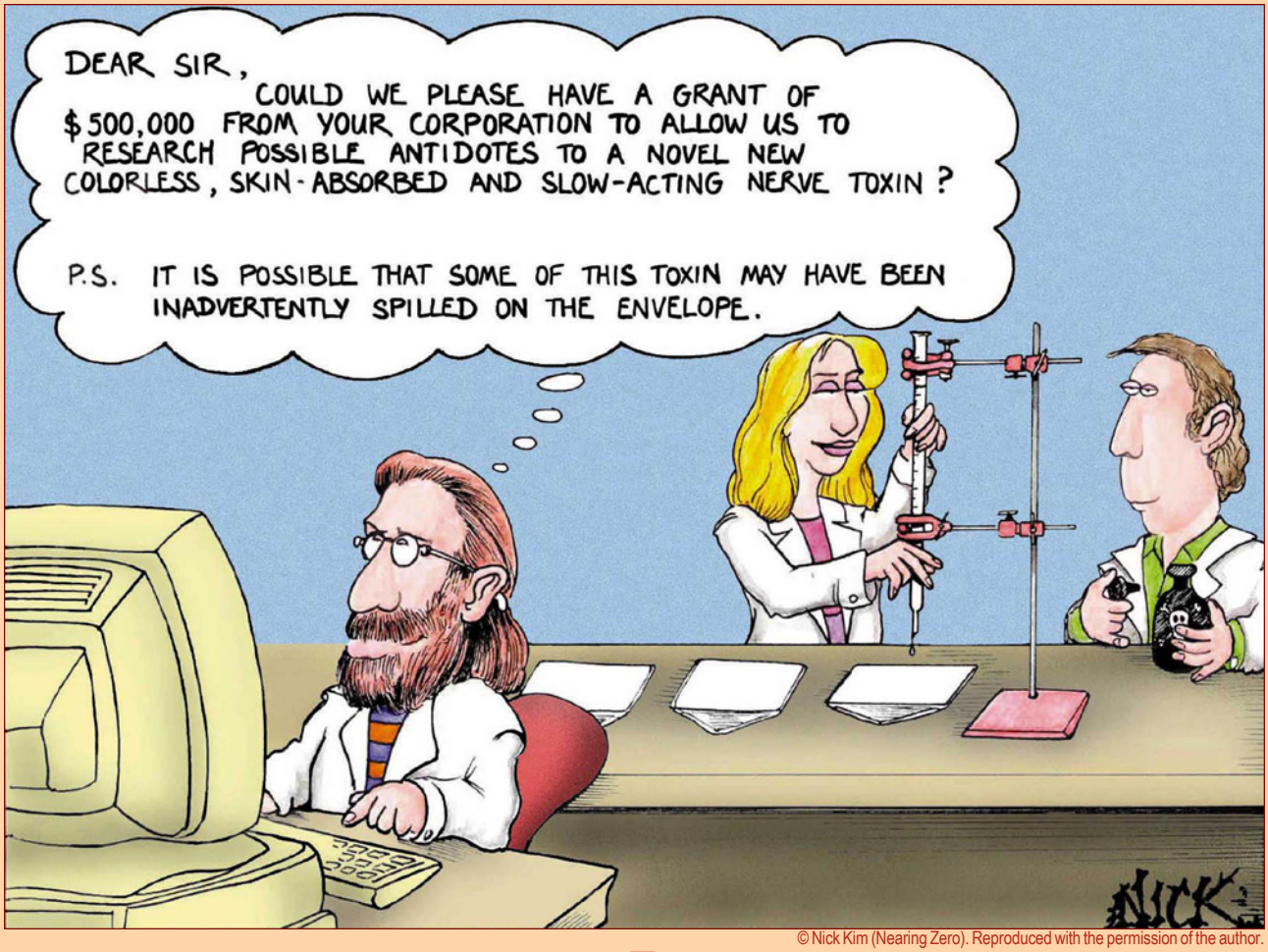
CARTOON



SPRU CELEBRATES ITS 40 YEARS ANNIVERSARY...

■ SPRU celebrates its 40 years anniversary with a conference

SPRU, the institute of Science Technology Policy Research at the University of Sussex in Brighton (UK), is celebrating its 40th anniversary in 2006 with a conference in September 11th-13th. The conference organisers, Prof. Ben Martin and Dr. Piera Morlacchi, have invited the participants to engage in a critical evaluation of the present and future research agenda of the Science, Technology and Innovation (STI) field.

The conference will explore empirical, theoretical and applied policy approaches in order to conceptualise the contradictory nature of modern science, technology and innovation, and thus provide practical policy guidance. The call-for-papers resulted in more than 320 papers submitted, of which 180 were selected for presentations. About 300 scholars are expected to attend. Prof. Sheila Jasanoff of Harvard University and Prof. Franco Malerba of Bocconi University will be the keynote speakers.

Following a SPRU tradition of open discussion, the conference incorporates debate sessions. One of debates, for example, will be on gender issues in S&T, with an exclusive female panel composed of Baroness Margaret Sharp (House of Lords), Prof. Diana Hicks (Georgia Tech), Prof. Sandy Thomas (SPRU/Nuffield), Prof. Carlota Perez (SPRU) and Prof. Robin Mansell (LSE).

Information about the SPRU 40th Anniversary Conference is available at:

http://www.sussex.ac.uk/spru/conf2006

■ Cradle of science and technology policy

SPRU was founded in 1966 as one of the institutes of the recently created University of Sussex. The University of Sussex, capturing the spirit of the 60s, had originally been organised not along disciplinary lines but on thematic departments or units composed of multidisciplinary teams. In this context, the economist Chris Freeman and geophysicist Geoff Oldham founded the Science Policy Research Unit (SPRU), with the aim of bringing to the fore the role played by science and technology in the economic and social development of societies. The social commitment and critical yet engaged participation in the policy-making process have been a constant to this day.

SPRU's influence in academia and policy practice in the diffuse field of Science and

Technology Policy has been strong and long-lasting. Its contributions include the draft in 1970 of the so-called *Sussex Manifesto* (a report of S&T policies for development that made its way to the General Assembly of the United Nations), the participation in the birth of the concepts of *National System of Innovation*, which was quickly adopted by the OECD, or the development of *Technology Foresight*. In terms of publications, SPRU gave birth and is the base of the journals *Research policy* and *Industrial and Corporate Change* among others.

In 2003, SPRU moved to the new Freeman Centre in a joint venture with the CENTRIM (Centre for Research in Innovation Management) of the University of Brighton. The Freeman Centre has up-to-date facilities for research and postgraduate teaching, including a library specialised in STI studies and state-of-the-art video-conference equipment.

In the field of scientometrics, SPRU's collective effort was instrumental in setting up large patent databases which made possible the research breakthroughs by Keith Pavitt and Pari Patel among others. On the bibliometric side, Ben Martin and John Irvine carried out some seminal studies on science indicators and Diana Hicks, Ben Martin and Silvan Katz published important papers on research collaboration. More recently Martin Meyer has made contributions on the science and technology linkages looking into nanotechnology.

■ SPRU's research agenda

Being one of the world's leading and largest institutions in the STI studies, the research agenda of SPRU covers a wide range of areas related to Science, Technology and Innovation, drawing in eclectic manners from various research traditions, with some pre-eminence of evolutionary economics, social studies of science, and technology management. One of the unique characteristics of SPRU is the diversity disciplinary backgrounds of its researchers: almost half of the 50 full-time researchers have at least one degree in engineering or natural sciences.

Currently the main lines of research include:

- Measurement and assessment of knowledge production and distribution
- Dynamics of emergent technologies (bio- and nanotech).
- Science and technology in developing countries
- Strategy and structure of innovating firms
- Environmental policy and regulation
- Transitions to sustainable futures (energy)
- Preventing biochemical and biological weapons

Since the early 1980s, SPRU runs its own post-graduate school, which is attended nowadays by over 80 doctoral candidates and 60 MSc students of four programmes: Public Policies for STI, S&T for Sustainability, Technology Management, and Industry and Innovation Analysis. One of the wealth of the institution is the cultural and geographical diversity of the students and alumni: about one third from the UK, one third from the EU and the rest from other nations, bringing knowledge and contacts from literally all over the planet.

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