Mohamed Gad-el-Hak's Opinion piece is one of several articles extolling the maintenance of high standards in research publications in the face of the increasing publish-or-perish frenzy in modern-day academia.[1]

Gad-el-Hak wrote that "the number of citations per publication is a fairer index of competence than the total number of citations." Yet, in his Opinion piece and in the letters that followed, there was no suggestion of any measure to address multi-author papers or the increased number of citations as a paper ages. I recently introduced the concept of the author impact factor (AIF) as a more precise measure of the impact of an individual author's published work.

In spring 2004, a committee in our department at the University of Florida suggested using the total number of citations (TC), along with the total number of papers, amount of funding, and other factors, as a measure for evaluating faculty performance for a specific purpose. I suggested a combination of the AIF, the TC, and the author's average journal impact factor (JIF) as a better way to evaluate a researcher's publication record.

Because the TC depends on various factors—among them age of papers, number of papers, and number of authors—it would be better to use additional measures. I defined the AIF as the average of the equivalent single-author annual citation rate (ESAACR) of all of an author's papers. For each paper, the ESAACR is the number of citations (NC) divided by the number of authors (NA) and the age of the paper (AP). That is,

$$\mathrm{ESAACR} = \frac{\mathrm{NC}}{(\mathrm{NA})(\mathrm{AP})}.$$

Averaging the ESAACR of all papers published by an author gives that author's AIF. For example, a particular paper published in the *Journal of Applied Mechanics* in 1986 has the following data as of June 2004: NC = 145 citations, NA = 2 authors, AP = 18 years, and ESAACR = 4.028 citations a year for each author.

The AIF is a normalization not unlike what we do in science and engineering: When we talk about weight, we introduce the concept of mass (normalization with respect to acceleration of gravity) and density (normalization with respect to volume); when we talk about distance, we also consider speed (normalization with respect to time).

The concept of AIF is restricted to a particular field. To allow a comparison across fields, such as mechanical engineering and chemistry, we can consider the relative ESAACR, which is defined by dividing the ESAACR of a paper by the recent or current JIF of the journal in which that paper was published. For example, the above-mentioned paper in the *Journal of Applied Mechanics*, which had a JIF of 0.628 in 2002, has an ESAACR of 4.028 and a relative ESAACR of 6.414. Then the relative AIF is obtained by averaging the relative ESAACR over all papers published by a given author, using the JIFs in the same recent or current year for all journals in which that author's publications appeared.

An author with a relative AIF of 1 would have equivalent single-author publications with impact, on average, close to the JIFs of the peer-group journals in her field. On the other hand, because the AIF and the relative AIF are measures related to a single author, her own papers would actually have an impact higher than the JIFs of her peer-group journals, since papers are generally written by at least two authors.

The computation of the AIF and relative AIF can be done easily with any spreadsheet software, and could even be provided as an additional feature in the ISI Web of Science webpage at http://www.isinet.com.

Surely, the AIF and relative AIF would speak volumes about the publication impact of the dean that Gad-el-Hak mentioned, the one who published one paper a week.

Reference

1. For more articles related to scientific and engineering publications, see the website Publish or Perish . . . at http://aemes.mae.ufl.edu/~vql/publish.or.perish.html

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Georg Rumer: A Microbiography

The August 2004 issue of PHYSICS TODAY contains two interesting articles (page 45 and page 51) devoted to the legacy of Edward Teller. They supplement his own recently published memoirs and help the reader to better understand this central figure in 20th-century physics and politics.

Neither Teller's memoirs nor these articles mention one of the most influential scientific achievements associated with him: the 1932 paper by Georg Rumer, Teller, and Hermann Weyl.[1] That work laid the foundation for the quantum theory of chemical valence by introducing what is now called the theory of resonance structures.

I learned about this work from Rumer, who later continued it alone. An oustanding Russian physicist, Yurij Borisovich Rumer (1901–85) was known in the West as Georg. He spent a few years in Germany just at the big bang of quantum mechanics. In a small booklet published in Novosibirsk to mark the 100th anniversary of Rumer's birth, one can find fragments of his recollections of his contacts with David Hilbert, Albert Einstein, Lev Landau, George Gamow, Max Born, John von Neumann, and other great scientists. These recollections, carefully transcribed from tape recordings, preserved Rumer's colloquial style.

Rumer's life was full of adventures before Göttingen and very difficult afterward. He spent years in Stalin's prisons and in exile; see *The Quantum Generation: Highlights and Tragedies of the Golden Age of Physics* by Margarita Ryutova-Kemoklidze (Springer,

Albert Einstein to His Son Hans Albert

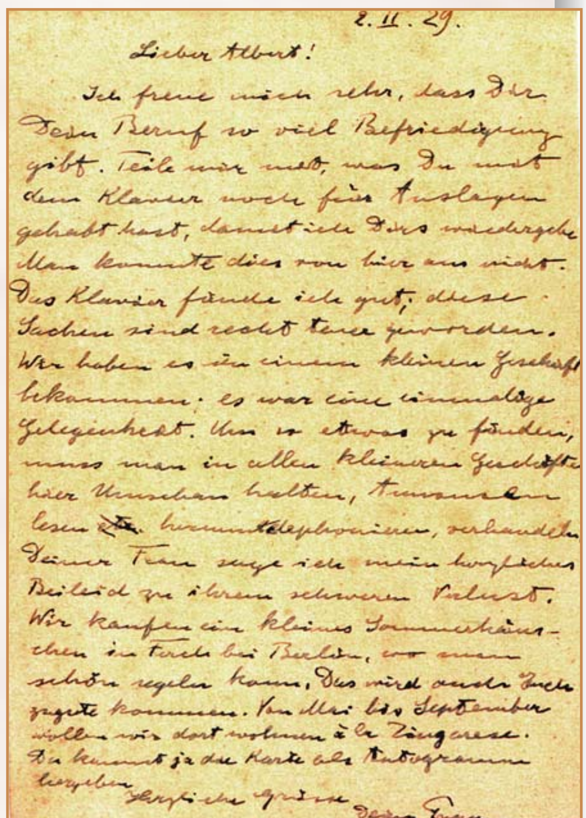
Annotated by Engelbert Schucking and
translated by Bertram Schwarzschild
(See the article by Schucking and Alex Harvey on page 34.)

I inherited this postcard from my father, Lothar Engelbert Schücking (1873–1943). He was a lawyer in Dortmund, Germany, when Einstein's elder son, Hans Albert (1904–73), consulted him on a legal matter. Hans Albert was working as an engineer in Dortmund at the time. Because he couldn't afford to pay for the consultation, he agreed instead to provide my father with his father's autograph.

On 24 January 1929, my father wrote to prompt him: "May I respectfully remind you that, in return for legal consultation, you promised to give me for my autograph collection something written by your famous father in his own hand."

Hans Albert replied on 11 March: "From here it was not easy to obtain something from my father, since he is very peculiar in this respect. Also, I was delayed by relocation, influenza, and a death in the family. I ask you, therefore, to excuse the delay, and I hope I can satisfy your request with the attached piece of writing."

*The card was written at the apogee of Einstein's fame. Three days earlier, the Prussian Academy of Sciences had published a six-page paper by him (*Proc. Pruss. Acad. Sci.*, 1929, p. 2) about unifying gravity and electromagnetism. The paper made headlines worldwide.*


2. II. 29.
Lieber Albert!
Ich freue mich sehr, dass Dir
Dein Beruf so viel Befriedigung
gibt. Teile mir mit, was Du mit
dem Klavier noch für Auslagen
gehabt hast, damit ich Dirs wiedergebe.
Man konnte dies von hier aus nicht.
Das Klavier finde ich gut; diese
Sachen sind recht teuer geworden.
Wir haben es in einem kleinen Geschäft
bekommen; es war eine einmalige
Gelegenheit. Um so etwas zu finden,
muss man in allen kleineren Geschäften
hier Umschau halten, Annoncen
lesen ~~etc.~~ herumtelephonieren, verhandeln.
Deiner Frau sage ich mein herzliches
Beileid zu ihrem schweren Verlust.
Wir kaufen ein kleines Sommerhäus-
chen in Ferch bei Berlin, wo man
schön segeln kann. Das wird auch Euch
zugute kommen. Von Mai bis September
wollen wir dort wohnen à la Zigeuner.
Du kannst ja die Karte als Autogramm
hergeben.
Herzliche Grüsse
Dein Papa.

Berlin–Charlottenburg, 2 February 1929
Dear Albert:

I'm glad that your profession gives you so much satisfaction. Let me know what expenses you had for the piano so I can reimburse you. I wasn't able to [cover the moving expenses] from here. I like this piano. These things have become quite expensive. We got it in a small store. It was a unique opportunity. To find something like that, one has to search all the smaller stores, read ads, phone around, negotiate.

My heartfelt condolence to your wife [Frieda] on her great loss. We're buying a small summer house in Ferch near Berlin, where the sailing is lovely. This will also be good for you both. We want to live there like gypsies from May till September.

You can pass on this postcard as an autograph.

Love,
Your Papa.

Einstein never did buy the summer house in Ferch, a lakeside town 12 km southwest of the Berlin suburb of Potsdam. As far as I know, his plan to buy a house just six weeks before the City of Berlin offered to give him one as a 50th birthday present is not mentioned in the standard Einstein literature. He apparently dropped that plan and accepted the mayor's offer. But the offer turned into such a bizarre comedy of errors, bureaucratic incompetence, and local politics that Einstein finally turned it down and built a house on his own, in Caputh near Ferch.

1995). While in exile, Rumer published 10 papers and the book *Studies in 5-optics* (Gostekhizdat, 1956). Later he worked in Academgorodok, the academic community near Novosibirsk, where I was pleased to make his acquaintance. When we celebrated his 70th birthday, he decided not to give a formal speech. Instead, he told the audience about his favorite work of the past: his work on quantum chemistry with Teller and Weyl.

Reference

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Illumination on Noctilucent Clouds

The article "Dusty Plasmas in the Laboratory, Industry, and Space," by Robert Merlino and John Goree (PHYSICS TODAY, July 2004, page 32) was interesting, informative, and well written. However, allow me to correct three statements. Although they are admittedly not central to the point of the article, it would be a shame to misinform readers with outdated information.

Recent results by Michael Gadsden[1] and by Sheila Kirkwood and Kerstin Stebel[2] show that the apparent increase in the observed frequency of noctilucent clouds over the past 30 years does not hold up to rigorous reanalysis of the observations. I concede that the belief in the increased frequency was widespread until August 2002, but it is wrong. The occurrence of these clouds does exhibit an apparent anticorrelation with the solar cycle, but their minimum occurs before the sunspot maximum. Whether the correlation is real or coincidental is still under study. There is no linear trend in the occurrence of noctilucent clouds.

Among hundreds of published temperature measurements taken near the high-latitude mesopause in summer, only one has been as cold as 100 K. To my knowledge, even the author who published that measurement no longer quotes it. Consensus among scientists working in the field is that noctilucent clouds occur when the temperature at an altitude between 80 and 88 km drops below 150 K, which occurs often at high latitudes in summer. The average mesopause temperature at high latitudes is near 128 K. Even that value is rather sensational, the coldest temperature on or near Earth.

It is completely new that water vapor released at high altitudes tends to collect near the poles, and such a statement should not be published without proof or reference. The global circulation in the summer stratosphere and mesosphere is upward and slightly poleward.[3] The large-scale, long-term average upward motion is a consequence of acceleration by breaking buoyancy waves. Through adiabatic cooling, the updraft leads to the cold temperatures that create the noctilucent clouds. The water vapor content in the mesosphere is difficult to measure, but appears to be near 5 parts per million by volume in summer at high latitudes.[4] The source of the vapor is still under study. Michael H. Stevens and coauthors have published one slightly elevated water vapor observation in the high-latitude mesosphere,[5] which may be a plume from a space shuttle launch. It is unlikely that any significant portion of observed noctilucent clouds should be due to shuttle launches, as those clouds have been observed since 1884.

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Correction

February 2005, page 80—Harvey S. Leff, vice president of the American Association of Physics Teachers, is a professor emeritus of physics at California State Polytechnic University in Pomona. ■