



Letter to the Editor

In 1976, when Wu, McCoy, Tracy, and Barouch found a Painlevé transcendent, at the end of an extensive and lengthy calculation in mathematical physics (of properties of the Ising model), likely it was surprising and surely not anticipated. Wu already knew of Painlevé transcendents from Ince's *Ordinary Differential Equations* (1926, 1956), and Myers (whose doctoral advisor was also Wu's) had earlier encountered them in a calculation in antenna theory.

Subsequent work by the various authors discussed in the recent articles on Harold Widom's work (*Notices* 69 (April 2022), *Bulletin* 59 (April 2022)) has made the appearance of Painlevé transcendents (and Toeplitz matrices and Wiener-Hopf methods) rather more natural in a variety of contexts. (In *Doing Mathematics* (2015), chapter 4, I have endeavored to develop these themes.)

Again, and again, surprising objects that appear in mathematical work, with subsequent further development, become justified and less surprising, so that lengthy calculations yield to understanding. Of course, unless those initial calculations were done, it is not so clear we would have found those surprising objects in a particular situation.

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Comment about “The National Research Rating System in South Africa: The Past Impacts the Future” (NAMS Feb. 2022)

The article of Kikianty and Nongxa offers interesting historical insights, including Apartheid and Academic Boycott but, in my opinion, is way too soft in criticizing the fine details of the procedures adopted by the NRF (National Research Foundation). The NRF is the only organization worldwide that attempts to rate individual researchers, rather than whole departments (as, e.g., happens in the UK), and it thoroughly fails at it! This is why. Applicants are rated as follows. Their scientific output is evaluated by international reviewers, some of whom are chosen by the candidate, some by the NRF. The problem is that their reports are processed by a local Scientific Committee (SC) which, more likely than not (the math community in SA is small), features at least one person who knows the candidate personally. Hence a biased judgment (too positive or too negative) often results. In my case a colleague from Applied Math chaired the SC and managed to downgrade me 2 levels after I had solved a major problem of coding theory. (This happened despite protests of eminent combinatorists; send me an email for details.)

So, what's the solution? The following proposals are refreshingly radical, also in the hope of inciting a discussion as to whether scientists *should be rated individually at all*.

First, let the reviewers do the rating, unfiltered by the SC! Second, only single-authored articles of the candidate are taken into account; it's simply impossible to measure the candidate's contribution in co-authored publications; this also affects the weighing of citations (details on my homepage). Of course there are smart mathematicians who almost never publish alone, but then unfortunately the revised system isn't for them. Third, at least for A-ratings one must insist that the candidate's field is not a niche topic with only 10 people worldwide participating. This ties in well with the fact that the NRF refuses to publicize the names of all mathematicians that ever received an A-rating. (Some of them I know and can provide details.)

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