Letters to the Editor

Review Journal for Older Books

I propose establishing a mathematical book review journal that only reviews books written more than fifty years ago.

Let me illustrate why by means of an example. Weinstock (*Am. J. Phys.* **50**(7), July 1982) claimed that an "examination of Newton's *Principia* reveals a fallacy in its purported proof of the ... fact that an inverse-square central force acting on a particle requires that the particle move in a conic-section orbit," and that "the body of Newton scholars ... missed the fallacy for nearly three centuries." In fact, Weinstock says that he "detected not even a timid tweet from any whistle blown to call attention to the actual *fallacy* embodied in the *Principia ... not since Johann* Bernoulli's in 1710." Apparently, Weinstock did not read the classical German literature, where the "mistake" was clearly recognised and understood again and again (e.g., Suter, *Geschichte der mathematischen Wissenschaften*, vol. 2, p. 164; Fleckenstein, "Johann I Bernoulli als Kritiker der 'Principia' Newtons," *Elemente der Mathematik* **1**, 1946, p. 101).

In my view, this episode is symptomatic of two modern evils. First, we as a community encourage disrespect for classical knowledge. I once overheard a graduate student express dissatisfaction that a Galois theory course worked over the complex number since "one never uses $\mathbb{C}$ anyway." We made these people. We could show our students how complex numbers were the heart and soul of virtually all algebra, geometry, and analysis throughout the 19th century. But we don't. We hurry them into research and this is what we get. Second, "everybody writes and nobody reads" (Erdős attributes this saying to Fejér; *Coll. Math. J.* **12**(4), 1981).

My proposed book review journal would strive to cure both these ills by reverting Weinstock's analysis that a modern scholar "has more interesting, more urgent, more rewarding ways to spend time and energy than to hack away painfully through the turgid exposition of a classic treatise" and that "that sort of effort is accordingly consigned to a future that never arrives" to say that there is nothing more interesting, more urgent, more rewarding than to study a classic treatise and that that sort of effort was carried out in a past that is now long gone.

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Complex History

Complex numbers and linear fractional mappings are of frequent use. Most students are familiar with these notions; they are usually taught with a few historical references. From that last point of view, the following facts may be of some interest.

1) Linear fractional maps are sometimes called Möbius maps and "homographies" by the French mathematicians. In fact, Euler introduced this mapping in his paper "De projectione geographica superficiei sphaericae"; it appeared in the *Acta academiae scientiarum Petropolitanae*, 1777 : I, 1778, pp. 133–142 (vol. 28, Series prima, p. 286). He wrote:

> For that reason, to the function $\Delta(z)$, let us give such a general form
>
> $$\frac{a+bz}{c+dz};$$
>
> (Hanc ob causam functioni $\Delta : z$ talem formam generalem tribuamus)
>
> $$\frac{a+bz}{c+dz};$$

It is a trivial but pleasant remark that since Euler the notation has not been changed. Euler adds all at once:

> [b]ut for z let us take the last form given above, which was $z = \text{tang } \frac{1}{2}v(\cos t \pm \sqrt{-1}\sin t)$
>
> (at vero pro z sumamus formam postremam supra expositam, qua erat $z = \text{tang } \frac{1}{2}v(\cos t \pm \sqrt{-1}\sin t)$).

Almost in the beginning of his article, Euler uses the following terms:

> This point in the plane must be so determined by two orthogonal coordinates x and y, so that... $x = \Delta(\text{tang } \frac{1}{2}v(\cos t + \sqrt{-1}\sin t)) + \Delta(\text{tang } \frac{1}{2}v(\cos t - \sqrt{-1}\sin t))$, $y\sqrt{-1} = \Delta(\text{tang } \frac{1}{2}v(\cos t + \sqrt{-1}\sin t)) - \Delta(\text{tang } \frac{1}{2}v(\cos t - \sqrt{-1}\sin t))$, where it is manifest that if the undefined letter of the function Δ were omitted, [these formulae] would give the construction of the hemisphere either boreal or austral.
>
> (id punctum in plano per binas coordinates orthogobales x et y ita determinari debeat, ut sit...)

2) At the end of the seventeenth century, a polynomial was said to be a "complex quantity" ("une quantité complexe" in Bossut's treatise of Algebra). So has been understood the polynomial $ax + by$ where $a = 1, b = \sqrt{-1}$. (Recall that the term imaginary, introduced by Descartes in his *Geometry* (1637) (from the fact that for instance the intersection of a line with a circle might not be visible at all), is not at all convenient for naming $\sqrt{-1}$.) In fact the first person who introduced an example of such a number was the physician Nicolas Chuquet in 1484. I bet that his paper fell into the hands of another physician, Gerolimo Cardano: he uses exactly the same words as Chuquet to describe these "impossible numbers". That is why I use the terminology "Chuquet-Cardan numbers" instead of "complex numbers":

I don't [want to] put in the mind that these numbers are awfully complex and dangerous entities.

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Reed Ends Arms Fair Business

A recent article by Allyn Jackson ["Jumping Ship: 'Topology' Board Resigns", May 2007] made reference to a campaign that I've been helping to coordinate. The aim of the campaign was to force Reed Elsevier to stop organising arms fairs. The method of the campaign was to galvanise scientific, academic, and medical opinion against Reed's involvement in this business.

On 1 June, Reed announced that they would withdraw from the "defence industry" during the second half of 2007. The reason that they gave was as follows:

"[I]t has become increasingly clear that growing numbers of important customers and authors have very real concerns about our involvement in the defence exhibitions business. We have listened closely to these concerns and this has led us to conclude that the defence shows are no longer compatible with Reed Elsevier's position as a leading publisher of scientific, medical, legal, and business content."

A substantial number of prominent mathematicians, including Sir Michael Atiyah, participated in the campaign, which included a publishing boycott, an on-line petition, and a number of high-profile open letters from different groups.

Reed's arms fair business turned over more than 20 million pounds last year. Despite this, the pressure that has been brought to bear by the scientific, academic, and medical communities has proved more than Reed could bear.

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Establish a Photo Archive

It seems that the AMS has been passing up an opportunity to build a valuable historical archive of photographs. I discovered this during the past few months when looking for official sources of photographs of distinguished women in mathematics—the AMS did not own a single photograph of any of the 25 women of interest to me. I was stunned, as I thought surely the AMS would at least have been taking photographs at the meetings it sponsors—if you take the photograph, you have the copyright to it. What could be simpler? Surely mathematics departments would be happy to donate hi-res scans of the photographs of their distinguished members, etc. The physicists, on the other hand, have a magnificient collection at the Segre Visual Archives of the Niels Bohr Library and Archives, which is a part of the American Institute of Physics. They say the library and archives also acquire materials that can best be preserved at the American Institute of Physics, including photographs, oral histories, books, AIP and member society archives, etc. Perhaps there is a good reason that the AMS does not maintain an archive, but I do not see it.

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Correction

Jonathan Sondow (Letters to the Editor, May 2007, page 590) was misidentified. He is an alumnus, not an employee, of Princeton University.

—Andy Magid