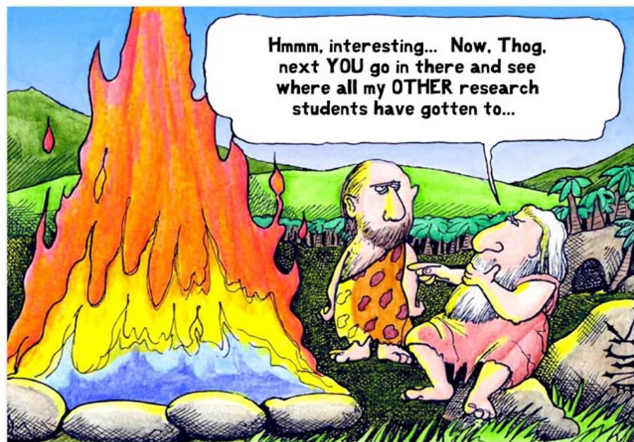


Becoming a professional mathematician

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Becoming a professional mathematician



Proto-Professor Algarth Zag, pioneer in fire research.

[Cartoon by Nick D. Kim, scienceandink.com. Used by permission.]

Becoming a professional mathematician

A PhD is seen as a passport to the professional mathematical community.

- ▶ What does this actually mean?
 - ▶ What is professionalism?
 - ▶ Are mathematicians really professionals?
- ▶ Some of the difficulties and dilemmas: the case of academic publishing.

What is a profession?

Prototypes: lawyers, medics, engineers, accountants...

No single definition, but shared characteristics:

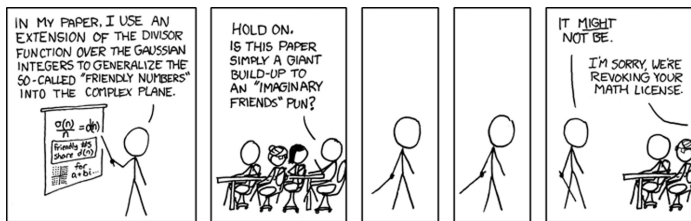
- ▶ specialised **knowledge** (not available to general public);
- ▶ commitment to certain standards of **behaviour**;
- ▶ formalised career structure and **certification**;
- ▶ **autonomy** and self-regulation;
- ▶ social **status** and remuneration.

Essentially a profession acts as a socially licensed monopoly.

Are we professionals?

Mathematical scientists have:

- ▶ no single professional body (even nationally);
- ▶ no single professional qualification or recognition scheme;
- ▶ no formal system of self-regulation;
- ▶ no special privileges, status or remuneration;
- ▶ no monopoly on doing maths or stats.



[Cartoon from xkcd.com.]

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We like to believe that we do have:

- ▶ a systematic body of knowledge;
- ▶ integrity, honesty and ethical behaviour;
- ▶ the right to collegiality and autonomy.

When the pressure's on, these beliefs may suffer...

The problems of publication and citation



[Cartoon by Nick D. Kim, scienceandink.com. Used by permission.]

Why do we publish?

Some (overlapping) reasons:

- ▶ to **communicate** ideas (to the community or the public);
- ▶ to **record** the results of our research for the long term;
- ▶ to claim **credit** or **priority** for our work;
- ▶ to look busy.

Different reasons may suggest different approaches...

Some forms of publication

- ▶ **Peer-reviewed journal papers** (the “gold standard”?):
 - ▶ pay-to-read (subscription);
 - ▶ or pay-to-publish (**open access**);
 - ▶ or “archive overlay” (new).
- ▶ **Conference papers** and abstracts:
 - ▶ peer-reviewed (often quite lightly);
 - ▶ or screened by abstract (or not screened at all).
- ▶ **Books**: academic or “popular”.
- ▶ **Preprints** in **repositories**.
- ▶ **Theses** and **technical reports**.
- ▶ Scientific **software** (subscription or non-subscription).
- ▶ **Patents**.
- ▶ **Websites** and social media.
- ▶ Newspapers, magazines and **press releases**.
- ▶ Poems or **anagrams**.

Yes, anagrams...

2. The true Mathematical and Mechanical form of all manner of Arches for Building, with the true butment necessary to each of them. A Problem which no Architectonick Writer hath ever yet attempted, much less performed. abccc ddeeeeee fgg iiiiiiiii lmmmmmmnnnnnoopr ssstttttuuuuuuuuux.

3. The true Theory of Elasticity or Springiness, and a particular Explication thereof in several Subjects in which it is to be found: And the way of computing the velocity of Bodies moved by them. ceiiinossttuu.

4. A very plain and practical way of counterpoising Liquors, of great use in Hydraulicks. Discovered.

5. *A new sort of Object-Glasses for Telescopes and Microscopes, much outdoing any yet used.* Discovered.

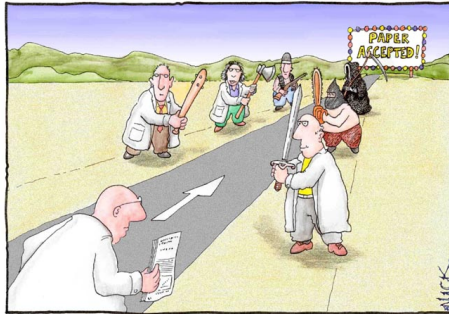
[From Robert Hooke, *A Description of Helioscopes, and Some Other Instruments*

(John Martyn, London, 1676). Image via Google Books.]

Why do we review and edit papers?

Some (overlapping) reasons:

- ▶ to **check** the accuracy of the work;
- ▶ to **filter** for quality and/or relevance to the journal;
- ▶ to **improve** the original manuscript;
- ▶ **revenge**.



Most scientists regarded the new streamlined peer-review process as "quite an improvement."

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Variations and alternatives:

- ▶ (Single- and double-) **blind** peer review.
- ▶ **Post-publication** peer review.
- ▶ No formal peer review (“let history decide”).
- ▶ Open-source editing.

Why do we cite work?

Some (overlapping) reasons:

- ▶ to provide **context** for our work;
- ▶ to ensure our claims can be **verified**, including
 - ▶ **data** we use but don't include, and
 - ▶ **results** we use but don't prove;
- ▶ to give **credit** for previous work, including
 - ▶ direct **quotation** or close **paraphrase**, and
 - ▶ the **ideas** on which we've built.

Some bad (but common) reasons for citing:

- ▶ to make your work look “academic”;
- ▶ to increase someone's **citation metrics**.

An unsolicited email (lightly edited)

Dear ■■■■■,

I am going to complete my Ph.D this December. If possible you will send me your published papers list. I will use these as citations. Similarly I will also send my published articles list to you. If you agree to this please send me the details.

In continuation of this I will communicate one paper with your name and my name. Similarly you will also communicate one paper with your name and my name.

Sincerely,

■■■■■

Some conflicts and controversies

- ▶ **Bibliometric gaming:**
 - ▶ boosting personal citation counts;
 - ▶ boosting journal impact factors.
- ▶ **Authorship** conventions and disputes:
 - ▶ who counts as an author?
 - ▶ who goes first (and last)?
- ▶ **Intellectual property** and open access.
- ▶ **Errors** and retractions.
- ▶ **Predatory** publishing.
- ▶ Abuses of **peer review** (by authors and reviewers).
- ▶ **Plagiarism**, “**patch-writing**”, and **self-plagiarism**.

What next?

In the handout and the links you'll find further reading on:

- ▶ professional and learned **societies**;
- ▶ professional **ethics** and dilemmas;
- ▶ developing your **career**;
- ▶ academic **publication** and its discontents.

Most of this won't be any use to you... yet.