

EDITORIAL

I want to draw the attention of younger members to Róisín Neurerer's letter in this issue, about EMYA, the EMS Young Academy. There is a related deadline at the end of July.

The manuals of logic often follow the tradition of millenia, and illustrate the universal quantifier with the sentence: *All men are mortal*. A glance at the contents of this issue will reveal evidence that this sentence is more than hypothetical. What were for me the fixed features of the Irish mathematical landscape have fallen away. I find myself in sympathy with the veteran, hardened by the loss of so many friends in a long campaign, who hesitates to befriend fresh replacements. And yet the editor of this Bulletin should have his finger on the pulse of our national mathematical life, and I have decided that it is time to pass the baton, so a new editor will take over for the next issue. I want to thank the members of the Editorial Board, the website manager Michael Mackey, and David Malone for their unfailing help and support during my tenure.

In their obituary of Seán Dineen, Michael Mackey and Pauline Mellon mention his Cistercian teacher Father Emmanuel in Roscrea. This was my mother's brother, William Curtis. It would be remiss of me not to pay tribute to him. The Holy Rule of St. Benedict makes no mention of Mathematics, and it may well be that Father Emmanuel was surprised to find himself teaching the subject after his final profession. He also had a mulberry plantation, bred silkworms, spun wove and dyed silk, mainly for clerical vestments, although he also gave me a rather dashing tie. He wrote a biography of Oliver Plunkett, Martyr. He was best with strong pupils, and he ranked Seán as his best ever. He did much for the mathematical community, and was a stalwart of the IMTA and CESI. For many years he produced solution-books for the Leaving Certificate Maths papers, published by Folens for the use of teachers.

One hears much talk of artificial intelligence these days, and there is a stock-market frenzy about it. The claims are over-stated. It is true that machines running programs can perform many tasks that required human action up to now, but the best of what we do is still far beyond the capacity of such robots. The recent excitement results from the discovery that work hitherto deemed to require analytic and literary talent can be produced by a robot with access to a sufficiently-large database of pre-existing text and a program that matches text and predicts the most likely sequel. It remains the case that what our members do when they conceive, ponder and solve mathematical problems is of another order. I engaged in a little dialogue with ChatGPT:

- Q:** What problem did O'Farrell and Zaitsev pose about reversible formal maps?
—: The reply was ok, high-level, accurate as far as it went.
- Q:** How would you solve the problem?
—: The reply revealed a critical misunderstanding about the topic. The program considered only reversers tangent to the identity. Only involutions have reversers tangent to the identity.
- Q:** Must a reversible formal map have a reverser of finite order?
—: The reply tried to answer a slightly different (but definitely different) question.
- Q:** I'm not asking whether every reverser has finite order. Must there always be some reverser of finite order?
—: This time the answer was just wrong. A couple of days later, essentially the same question elicited a different, correct answer:

- Q:** Must a reversible formal map have a reverser of finite order? Please format your answer in LaTeX.
- : The program has now found a more sensible, but less exciting answer — the problem remains open — and came up with a competent LaTeX version.

The program is able to locate some data about our work, locate it correctly in relation to the spectrum of research areas, pick apart the question and find correct definitions of the terms, generate examples, and apply elementary logic reasonably accurately. It writes grammatically-correct English, and its output consists of a nicely-structured list of propositions, ending with a coherent summary. But it doesn't tell me any true thing I don't know, and it is just plain wrong in key assertions about the problem. It's like a hardworking first-year graduate student with a slightly loose screw, who will never make it unless I decide to write his thesis for him.

It must be admitted that there is a certain pleasure in conversation with the program. Its summaries of famous complex advanced topics resemble the coffee-room conversation of visiting colloquium speakers. As a substitute for talking to oneself while setting up a question to study, it is almost as useful as a well-motivated hardworking student who lacks a real flair for the business, and it may be kinder to dismiss the weak students sooner and talk to the program. On the other hand, the student who loves mathematics but lacks the talent to penetrate the real difficulties is a human being, with all the limitless value that implies, and with other talents and possibilities that, once discovered, point the way to the unique purposes for which he was created. One does not feel the same urge to help the program find its way in the world, and one has to be conscious of the damage that can result from its subtle errors¹

The matter is nicely illustrated by a line in David E. Dunning's review of Stephen Budiansky's biography of Kurt Gödel, in the January 2023 LMS Newsletter. He gives high praise to this account intended for the general public, but then says: "Readers of this *Newsetter* will find the mathematical content thin" (This adds a spicy ambiguity to his later advice: "Naturally anyone with an interest in Gödel or the history of logic ought to waste no time obtaining a copy of this book."). The brutal fact is that we differ from the general public in that we regard the fact that the great Gödel asserted something as interesting, but inconclusive until we have personally read through and checked the proof, or come up with our own. Arguments from authority, like arguments *ad hominem*, have no value to us. Many people recoil from the hard stuff, from the page that takes a day to digest, but we can't help digging in. It is not hard for us, no more than it is hard for the young to be beautiful.

There is a much more thorough examination of ChatGPT and its relatives, and the opportunities and dangers they pose, in the January 2024 issue of the AMS Notices. In particular, the article by Schmidt and Meir² tells an alarming tale. They demonstrate that there has already been some pollution of the mainstream research literature by nonsensical or false AI-generated content. I hope we have not as yet published any articles or abstracts written by generative AI tools, and just to be clear we expect our contributors to adhere to COPE guidelines (at least). See publicationethics.org/cope-position-statements.

¹The program also exhibited a kind of stolid solemnity, when asked what is purple and commutative. It seems to know all the jokes, and to know about the anatomy of wit, but its own position is Victorian.

²Paul G. Schmidt and Amnon J. Meir. *Using generative AI for literature searches and scholarly writing: Is the integrity of the scientific discourse in jeopardy?* NAMS 71, no.1, pp93-104.

For a limited time, beginning as soon as possible after the online publication of this Bulletin, a printed (grayscale, not full-colour) and bound copy may be ordered online on a print-on-demand basis at a minimal price³.

EDITOR, BULLETIN IMS, DEPARTMENT OF MATHEMATICS AND STATISTICS, MAYNOOTH UNIVERSITY, CO. KILDARE W23 HW31, IRELAND.

E-mail address: `ims.bulletin@gmail.com`

³Go to `www.lulu.com` and search for *Irish Mathematical Society Bulletin*.