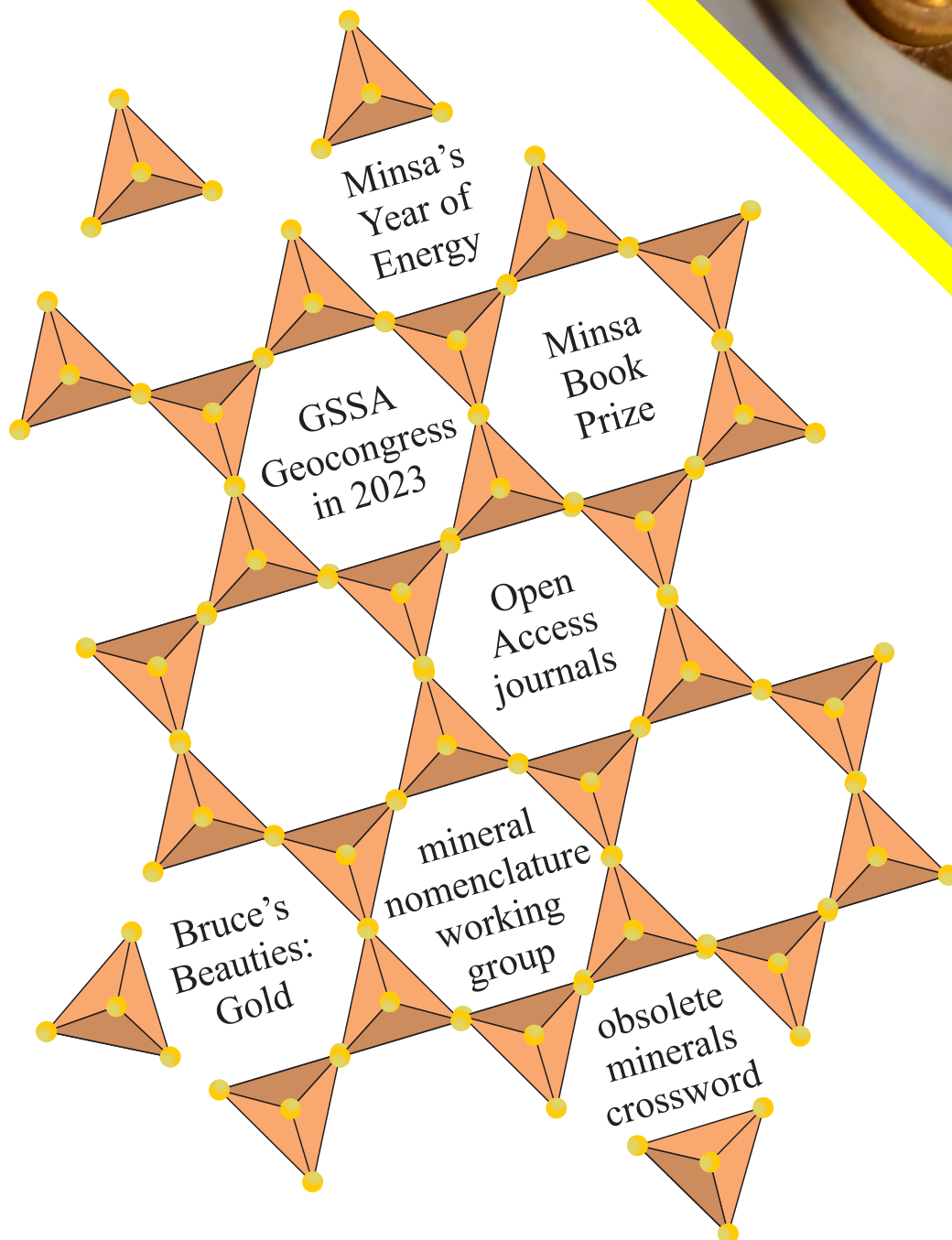


# the Geode the Geode



Publish, perish, and  
poverty: research  
dissemination in the  
modern era



## The GEODE

Minsa  
Newsletter  
Volume 10  
No. 1  
March  
2023



website: [www.gssa.org.za/Minsa](http://www.gssa.org.za/Minsa)  
e-mail: [Minsa@gssa.org.za](mailto:Minsa@gssa.org.za)

# the Geode the Geode

NEWSLETTER

Volume 10 No. 1

March 2023

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**Next issue theme:**

**Mineral classification: how does it work, and do we need a revised classification paradigm?**  
(see also pg. 17)

## Forthcoming Events & Attractions

*Some events are still missing specific dates: Minsa will let you know! Watch for e-mailed announcements. All dates are 2023 unless otherwise stated.*

- The Year of Glass talk: Graham Reeks (TBA)
- Night at the Museum 7 (TBA)
- Southern African Powder Diffraction Conference - 16-21 April 2023. Midgard Conference Centre, Namibia.
- 9<sup>th</sup> International Platinum Symposium, 3-7 July 2023, Cardiff (U.K.).
- SAIMM: Geometallurgy Conference 2023 'Geomet meets Big Data', 5-6 September 2023 at Hazendal Wine Estate, Cape Town.
- ICAM 2023: China, September – details still to be organised.
- 5<sup>th</sup> Southern African Minerals Symposium, 25<sup>th</sup> Nov. 2023.
- "Meet-a-Mineralogist" tour to Namibia (planned for 2024)

## The Editor's Site

Welcome to the first issue of Volume 10 of the Minsa quarterly news magazine; yes, this is our tenth year of providing you with the vital mineralogical news that you need to know. For example, in this issue we examine the theme of where the money comes from, and where it goes, and at what cost to research, in the modern sphere of scientific research publication. This is examined in the form of a rambling discourse

provided by me, followed by a more concise one from the managing editor of an actual research journal, in this case, The Canadian Journal of Mineralogy and Petrology (formerly The Canadian Mineralogist). In addition to this, our association Chair visits, and enjoys coffee brewed in, as many coffee-named locations in this country (South Africa) as he can locate. Readers are urged to provide additional suggestions as to where our intrepid, evidently under-caffeinated Chair might go for more such landmark stops, at his request.

In other news, Minsa awards its 2022 book prize to Ms Siyasanga Dyan for her M.Sc. thesis, recorded for posterity in a photo from the January Geocongress. Ms Dyan is currently pursuing her Ph.D. research at Rhodes University. The GSSA Geocongress (or GEOCONGRESS, as it also goes by) held in Stellenbosch in January, is also provided with a eulogy by its principal organiser, Bjorn von der Heyden, to whom we are suitably grateful (for the meeting, as well as the article) in these pages.

I have made a brief sortie into the dark world of artificial intelligence as it applies to mineralogy and to its detectability in academia by proposing a self-eponymous mineral to ChatGPT. We wrap up with a photo essay from Bruce Cairncross on gold from southern Africa, and a crossword puzzle and solutions to the last one.

As they (probably) say in the microverse (see Ant Man, if he were in the flight tube of a TIMS), may your ions remain unbonded, and your vacuum impeccable.

Steve Prevec

**From the Chair**

This is a beautiful country...

I think I can speak with some authority...though not a lot...having travelled thirty odd countries and having lived in another. After an incredibly successful Geocongress in Stellenbosch (where Minsa hosted an equally successful Applied Mineralogy session), I took the time to come back home the long way round... picking rocks up along the way of course... a “mineralogical meander” so to speak. But mostly I took

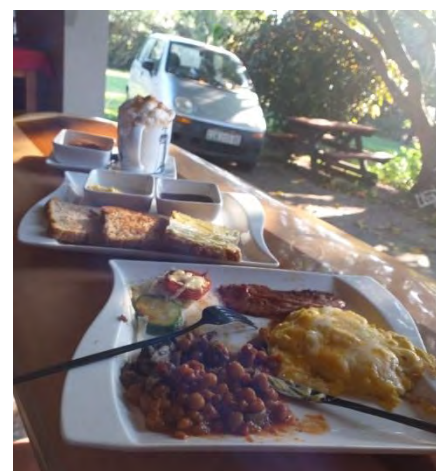
the time to have some coffee...where none was to be had...so I brought my Mocha pot.



Igor Tonžetić  
Chair, 2022-23  
Minsa Executive  
Committee

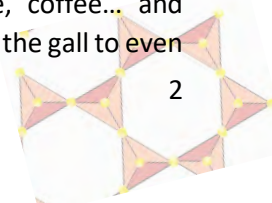
I spent a week in Cape Town...three days in Jeffreys Bay...Hole-In-The-Wall, Coffee Bay, Elliot, Molteno (finally completing my Stormberg Group trifecta after having seen Clarens many times before), Steynsburg (where I logged in remotely to one of our MINSa committee meetings), Koffiebus/Teebus (the buttes not the dorps), Trompsburg, Fauresmith and Koffiefontein before making my way back home. It took me some time...some thought I was hitchhiking.

*The Coffee Snob  
(at Trompsburg).*



*Coffee at Coffee Bay.*

As you might tell, coffee was the theme. I am a coffee snob. I don't consider instant coffee, coffee... and blame the American civil war for having the gall to even





consider diluting any coffee with chickory. I'd like to think that now I'm the only person in the country who's had a coffee in every place that has "coffee" in its name, though doubtless someone will inform me that I left one place out...and that will be my excuse to go grab a rusk in Molteno.



*Coffee at Koffiebus (with butte in the background).*



*Hole in the Wall (Coffee Bay). All images courtesy of I. Tonžetić.*

Fauresmith was really interesting, providential and beautiful...it is a town that likely few people have heard of. It is the second oldest town in the Free State and is one of only three in the world where the railway line runs down the centre of the main road (or at least used to). And my room in the Phoenix Hotel was "Hope". Historically, the Orange Free State's house of Assembly had to vote between Bloemfontein and Fauresmith as to which would become the capital city. Fauresmith lost...by two votes...and that was the difference between becoming a behemoth of urbanisation and

the Shire. Often I fixate on what might have been and dwell on questions of "what if" ...but here it occurred to me that maybe there is a place in this world for serendipity or synchronicity or simply just accepting the way things are or have turned out. Here, there was a beauty...and it would've have been a travesty...a crying shame...had it turned out any other way.

I had agency in picking my trip. But submission, in some circles, is a gospel virtue.

*Igor Tonžetić*

### **Minsa News**

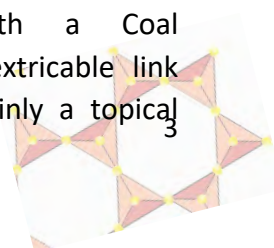
**Schlieren and Schollen (bits & pieces, migmatitically speaking)**

### **2023 Year of Energy**

Minsa has supported the UN 'international year themes' since 2019; trying to give a 'mineralogical flavour' to the themes via an annual presentation to our members, either at our AGM, or to conclude the year of the topic. We feel this adds to our international relevance – after all the Geode already has a link on the IMA website! Many will recall the hugely popular 'Year of the Periodic Table' talk of 2019' and the really interesting 'Meeting of Mines' presentation which concluded the 'International Year of Plant Health' in 2021. The talk 'A low carbon future - show me your metal' addressed the UN 2021 theme of 'International Year of Creative Economy for Sustainable Development'. The United Nations General Assembly formally declared the year 2022 as the 'International Year of Glass'.

This year we have been seriously challenged to find mineralogical angles corresponding to the UN topic for 2023, which is the 'International Year of Millets' (to raise awareness of the crop's climate-resilience and nutritional benefits; reader suggestions invited!).

Minsa started the year with a Coal Utilisation series. Coal and its inextricable link to Eskom in South Africa is certainly a topical subject. Just as



important to the public debate is coal’s legacy of acidic groundwater, millions of tonnes of fly ash and vast areas of mine-scarred terrain in our beautiful country.

The Coal Series kicked off with a visit to Lethabo Power Station in February 2023. Professor Nikki Wagner and colleagues hosted a hybrid workshop in March 2023 on aspects of coal petrography and we completed the series with a visit to the Eskom Research and Innovation Centre (ERIC), as well as the Mineralogical Laboratory at Eskom.

The Coal Series thus focussed on all aspects of energy (or the lack thereof) in South Africa.

We have decided therefore to adopt **Energy** as the Minsa 2023 theme.

We are working at securing speakers or Geode articles on clean coal, clean steel etc. and will, by popular demand, be organising more visits to ERIC to catch up on the energy labs we couldn’t visit the first time around.

So....watch the Minsa space as 2023, "The Year of Energy", unfolds!

*Contributed by Petra Dinham*

### Minsa Book Prize 2022

The Minsa Book Prize is awarded annually to either an Honour’s or Master’s dissertation of high merit focused on applied mineralogy (>50% content) completed at a South African university. At the recent Geocongress in Stellenbosch, Minsa had the privilege of awarding its 2022 Book Prize to Ms. Siyasanga Dyan from Rhodes University for her MSc dissertation titled: “Constraining the role of carbonatite assimilation on spinel stability in oxide ores of the Flatreef, Bushveld Complex, South Africa”. The dissertation was completed under the supervision of Prof. Steve Prevec (Rhodes University Dept of Geology). The award ceremony took place during the Applied Mineralogy session, organized, chaired and sponsored by Minsa, on Friday 13<sup>th</sup> January, 2023.

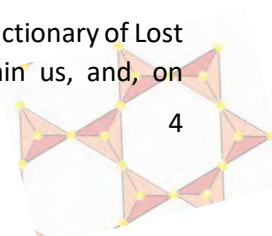


*Ms. Siyasanga Dyan (right), being presented with the 2022 Minsa Book Prize by Igor Tonžetić, 2022/23 Minsa Chairperson, at Geocongress 2023 in Stellenbosch.*

### Expression of Interest: Working group to collate geological / Earth science terminology from all of South Africa’s national languages

The Mineralogical Society of South Africa (Minsa) is looking for volunteers to form a working group that seeks to collate a term bank for all of the specialised terminology related to mineralogy, geology, geomorphology and the general earth sciences. The purpose of the term bank is to serve as a repository for these specialised terminology across South Africa’s eleven national languages.

As so aptly stated in Pip Williams’ The Dictionary of Lost Words: “Words define us, they explain us, and, on



occasion, they serve to control or isolate us.” To ensure that our discipline can be more encompassing, the present drive seeks to collate all existing formal and informal nomenclature related to the South African geological sciences. The idea is still very much in its conceptual stage, and will benefit from as many diverse insights and participants as possible. Should you wish to be a part of this working group, kindly send a short

expression of interest email to the Chairperson of Minsa: Igor Tonzetic ([igor.zeljko@gmail.com](mailto:igor.zeljko@gmail.com)) and/or Bjorn von der Heyden ([bvon@sun.ac.za](mailto:bvon@sun.ac.za)).

*Contributed by Igor and Bjorn.*



**Earn CPD points through mentoring!**



Be “the mentor you wish you had” and assist in giving some guidance to geology students by signing up to be a mentor through the Bridge the Gap Geosciences Guidance Program (BTG).

BTG is a student run organisation that focuses primarily on mentorship between undergraduate and postgraduate students. However, all interested individuals are invited to “bridge the gap” between students and industry by joining the BTG program. This could take the form of mentorship, giving a talk, leading an excursion or simply providing sponsorship.

To get involved please complete the Google form via this link:  
<https://forms.gle/Sf5tMciuSStAQuFL8> or email [bridgethegap.wits@gmail.com](mailto:bridgethegap.wits@gmail.com) for more information.




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## Articles

### GEOCONGRESS 2023

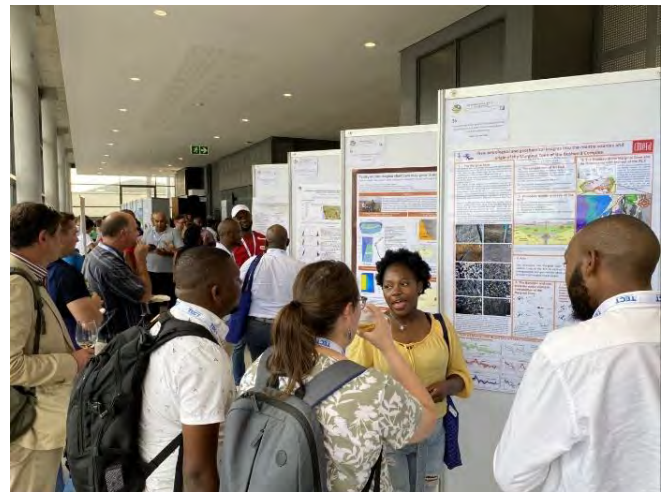
The Geocongress event ran successfully between 11 and 13 January 2023 in a sunny Stellenbosch. Over 400 delegates attended the in-person component of the event, with a smaller contingency taking part from remote settings, using the hybrid functionality that allowed remote speakers and remote audiences to partake. From an informal census of the in-person delegates, the response was overwhelmingly positive, with delegates really enjoying the opportunity to get together and have interpersonal interactions after the two years of pandemic-induced lock-downs and forced virtual interaction.



*Geocongress 2023: "The next 125 years of the Earth Sciences" belatedly celebrating the mutual age of the Geological Society of South Africa, and Stellenbosch University's Department of Earth Sciences. (image courtesy E. Davies).*

The event really hit its target of appealing to a diverse array of delegates, encompassing industry

professionals, academic researchers, and a large number of students (who we believe to represent the future of our science). The talks were mostly of a very high calibre and it was great to see local researchers, and indeed the students, stand up and present at a standard that was comparable to the talks given by the high-level internationally-acclaimed scientists who attended. This bodes well for continued southern African Earth Science excellence and competitiveness when taken in a context of the international scientific arena.



*The poster sessions were lively and interactive. Conversation, food, and drink all flowed in a decidedly non-viscous manner. (image courtesy E. Davies).*



*The four venues offered sufficient seating to comfortably accommodate all 400 delegates. The conference lead Dr Bjorn von der Heyden was only able to welcome everyone in shorts because of the 35 °C heat and the fact that he has exceptionally nice legs.*

The event would not have been possible without the efforts of the local organising committee, the GSSA, the various conference organising entities and service providers, the excursion and workshop organisers, the session chairs, and importantly, the delegates. You are all too many to thank individually, however, you know who you are, and you can be proud of what we achieved in making this event a success. Thank you.

For those interested in re-reading some of the conference abstracts, the abstracts volume can now be found on the [GSSA's website here](#). Inasmuch as we are sure to see each other again at a yet-to-be-confirmed Geocongress 2025, please, if you are in the Stellenbosch area before then, do pop past the Earth Sciences Department for a visit. If you're lucky and we're feeling nostalgic about the Geocongress evening activities, we'll even take you for a drink at one of the now-infamous bars down the street.

*Contributed by B. von der Heyden*

*Stellenbosch University*

## The March issue theme: "Publish or perish".

This has been the mantra in the academic community for decades now. How is quantity of output weighed against quality, and by whom? What are the implications? What is a predatory journal, and what is not? What is an "open access" journal? Why do I sometimes get asked to pay page publication fees, and sometimes not?

## Publish, perish & poverty: the professional journal game

**S.A. Prevec**

*Dept of Geology, Rhodes University, Makhanda, RSA  
s.prevec@ru.ac.za*

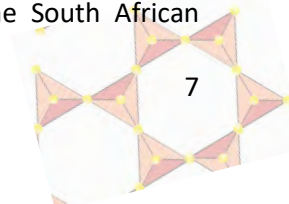
For this theme, I have solicited a separate contribution from an actual geological research journal, in this case, from Mackenzie Parker, the Managing Editor of the international journal *The Canadian Journal of Mineralogy and Petrology* (formerly *The Canadian Mineralogist*). In addition, I have solicited feedback

from the Research Office at my own university, which has been incorporated into the following article.

### Context of academic research publishing

Research publications fundamentally underpin the career orientations of most science academics, and has been the basis for extensive study over recent decades, a lot of it involving mathematical analysis through game theory principles. Fundamentally, we can contextualise this by observing that in order to qualify for appointment as a university-based geoscientist, a Ph.D. is required, and the promise of research potential as manifested in the ability to produce publishable outputs that will benefit the relevant professional community. The fact that teaching might in fact take up most of your time is ignored completely (arguably justifiably) in assessments by funding bodies such as our National Research Foundation (NRF), whose function it is to optimise the use of limited research funds. In collaborative grant proposals, this is accommodated by virtue of the requirement that each contributing researcher states what percentage of their time will be committed to the proposed project. The qualification for a Ph.D., the minimum benchmark for a (arguably ironically titled) Lecturer position, is that research potential has been identified through the successful completion of an independent research project, in the form of the Ph.D. thesis document. Actual "lecturing" ability is assumed.

Having achieved an academic appointment, the ideal expectation is that research will be facilitated in the form of training and mentoring post-graduate students, collaborating with colleagues with expertise in complementary subdisciplines and access to analytical equipment. The latter are not necessarily available in-house (and few South African institutions have the full suite of analytical toys available, nor should they necessarily be expected to). Research is funded through research granting agencies, either domestic (the NRF, in South Africa) or via domestic-international government partnerships on defined research themes, through corporate sponsorship (such as mining companies, in the geosciences), and from institutional support. The latter is typically nominal (i.e., enough money to keep you going, but not designed to run big research programmes with), and is effectively government-funded in the South African





context; In South Africa universities are eligible to claim financial benefits from the Department of Higher Education and Training (DHET) for publications in journals recognised by the International Scientific Indexing (ISI) body, in the form of a rating. The ISI rating provides a basic certification process for journal legitimacy. The DHET then provides their own list of accredited journals, beyond this, to which additional journals can be motivated for and added. Effectively then, an academic researcher whose research is (at least partially) funded by their university is spending money that they contribute towards earning, and is hence sustainable, in principle. The successful completion of post-graduate research theses resulting in the awarding of a university post-graduate degree is also similarly rewarded through a financial incentive paid from the DHET to the host institution, in South Africa. The implications of research incentive funding in South Africa will be revisited later in this article.

The pressures to raise and maintain research funding, a corresponding predetermined level and quality of outputs and postgraduate students, vary widely between institutions and countries. In South African science, in general, the pressures are relatively light; normally the confirmation and continuation of an academic post in South Africa is not contingent on achieving quantitative targets in these categories. This contrasts to expectations in equivalent careers in many parts of Europe, Asia and North America, largely because the opportunities for access to funding and students are correspondingly sparse, on average. This varies widely between disciplines and subdisciplines, but in general I perceive this to be true, and this will not be addressed further in this article.

*Research output*

As is the case globally, the research output from South African-based academics has increased steadily in recent decades, accelerating slightly in the past twenty years, as shown in Figure 1.

In terms of the productivity of individual academics, this can be estimated from the DHET accredited output data as shown in Figure 2, which shows the annual increases in average outputs per person in South Africa in terms of output units, and also weighted output units, where research M.Sc. and Ph.D. graduates are weighted more heavily (3 units each).

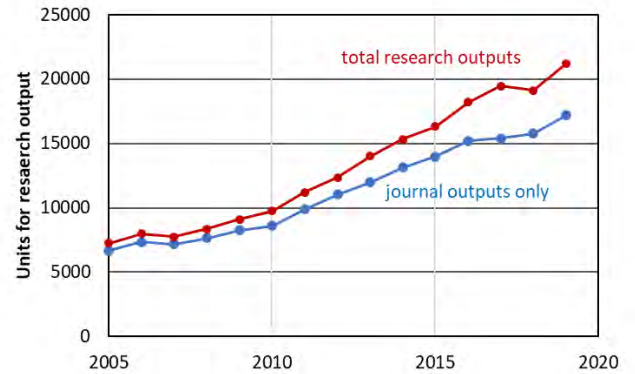


Figure 1. Growth rates for research outputs from South African-based researchers (modified after DHET, 2021), as measured in accredited units. Total research includes books, conferences, and journal outputs (but not postgraduate degrees awarded).

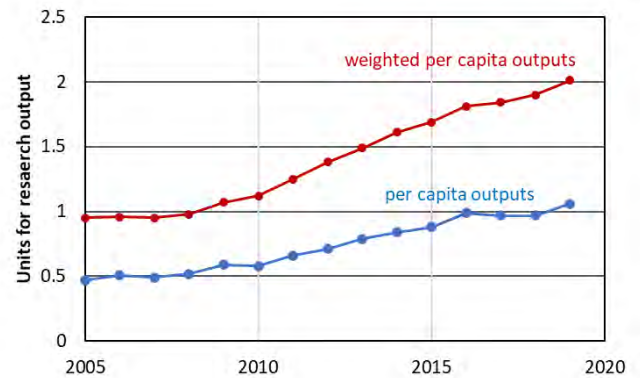
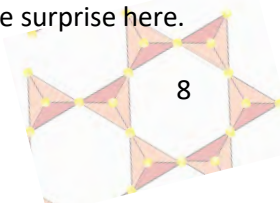


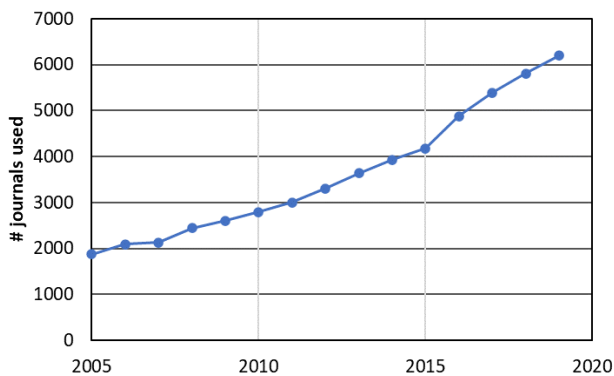
Figure 2. Publication outputs by South African-based researchers, per output (in blue) and with outputs weighted according to post-grad level (see text for explanation), after DHET (2021).

It is noteworthy that in recent years the per capita average has reached one unit per year (unweighted), and two units per year weighted, speaking well of our improving abilities to produce research and to get research postgraduates graduated. However, note that the total number of outputs includes all publications from associated researchers who are not necessarily counted in the university head counts, such as unpaid Research Associates, affiliated researchers from other organisations or independent consultants or industry-based associates who publish under the by-line of a university. The average value is therefore a maximum value, higher than the real average per person. If you are interested to know where your university stands in this scheme, you are welcome to look up the DHET annual reports; I will not be spoiling the surprise here.



Of this published output, the physical sciences (including the Earth Sciences, with Physics and Chemistry) contribute about 10%, with humanities, social sciences, and health sciences contributing about 50% of the output (DHET, 2021). Most (>90%) of the Physical Science outputs come through journal outputs, with around 5% from books and book chapters, and half that again from published conference proceedings. (By contrast, in the humanities and social sciences the ratio of outputs from journal articles to book contributions is closer to 2:1, rather than the 20:1 in physical science.)

As might be expected, the increase in publishing output corresponds to an increase in the available outlets for publication. South African-based academics have been publishing in an increasingly broad spectrum of journals, a number which has tripled over the past twenty years. This presumably represents an increase in the number of journals catering to specialised subdisciplines, combined with the need for a wider range of publishing formats (see Open Access, below).



*Increase in the number of journals in which South African-based academics publish over the past fifteen years (modified after DHET, 2021).*

Considerable attention has been paid to the implications of the increase in publication output and the proliferation of journals accommodating this, with the concern being that with the huge increase in outputs and the demand for academics to produce, there may be compromises in quality of output. A 2005 study indicated that the increase in journal quantity itself is not the cause of higher output rates, and in fact, through the resultant competition between journals for quality research, has actually resulted in better quality outputs, on average (Goel & Faria, 2005). It appears that in fact the fragmentation of journals, also

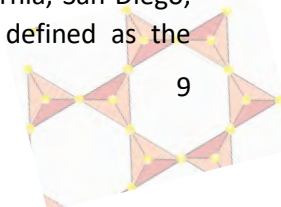
referred to as ‘twigging’, preceded, or went hand in hand, with the increase in productivity, rather than occurring as a response to increased pressure to publish. Both the increased specialisation of geoscience and the resultant pressure for multi-disciplinary research were initially viewed as detrimental to the discipline and to research practice (Fratesi & Vacher, 2008; p. 4), perhaps surprisingly from our current vantage point. A study of the increase in publication volume within a specific selection of geoscience journals was used to illustrate the robustness of geoscience research, reflecting temporal drifts in specialisation, the impact of unifying concepts (plate tectonics, lunar research) and the evolution of geoscience as “Big Science” from the post-war (WW II) era to the present (Fratesi & Vacher, 2008).

### *Research quality*

Mention has been made here of concerns over publication quality. This is linked to but not synonymous with journal quality. In the same way that a valuable diamond can be found in a crappy weathered old kimberlite (send letters of complaint c/o the GSSA), useful papers can also be found in unlikely places. Adler *et al.* (2014) note the inappropriateness of equating the perceived value of a given journal (based on impact factor) with the value of any given paper therein, as an obvious example, amongst other potential pitfalls in assessing output quality. However, both the journals and individual outputs can be assessed for quality in the sense of their utility to their professional community, even though admittedly these are not directly correlated. This perceived utility is assessed through the use of citation indices, which track the frequency by which other authors cite any given published material.

A generalised illustration of the progressive change in citation value over time within a restricted scientific context (in this case, metallurgical science), can be offered (Fig. 3), wherein the perceived value of individual sources diminishes with time, while the overall number of citations accumulates.

The citations are used to define indices such as the *h*-index, beloved by Google Scholar aficionados, for example. The index, named after its creator, J.E. Hirsch (a physicist at the University of California, San Diego, who devised the index in 2005), is defined as the



maximum value of  $h$  wherein an author (or journal) has published at least  $h$  number of papers that have each been cited at least  $h$  times.

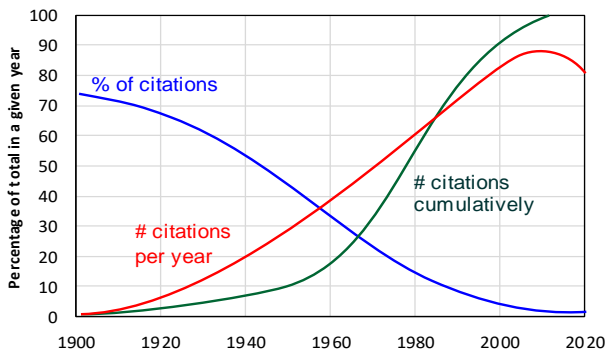


Figure 3. General trends in citation within a restricted research discipline. After Laznicka (2010).

According to Wikipedia, the  $h$ -index “correlates with obvious success indicators such as winning the Nobel Prize, being accepted for research fellowships and holding positions at top universities.” More pragmatically, it is useful as an index of relevance of publishers (authors, groups of authors, journals). High values of  $h$ -index indicate both that the author has been productive and that other colleagues are making use of those outputs. Journals use citations as the basis for journal impact factors (JIF, or IF), an index that reflects the annual mean number of citations of articles in a given journal (over a rolling two-year time period) (Anon, n.d.). The Wikipedia site (Anon, n.d.) goes on to note the inappropriateness of applying the impact factor as a means of assessing the value of research outputs of individual researchers. As Adler *et al.* (2014) observe: “Everything should be made as simple as possible, but not simpler,” Albert Einstein once said. This advice from one of the world’s preeminent scientists is especially apt when assessing scientific research.”

#### *Benefits of research productivity*

Although this probably goes without saying, even without the requirement of academics to meet specific targets in research output, universally, there are various less obvious benefits to optimising research productivity. Higher quantity and quality of outputs improves the chances of access to research funding, through better ratings, and more robust project proposals; the bottom line of research project funding is predicated largely on whether your research findings

get shared, preferably in a robust medium such as peer-reviewed literature, rather than whether the given project “worked”, per se. In addition, more productive researchers are, on average, viewed as more appealing collaborators, and benefit from an enhanced professional standing (which may be compensated for by their personalities, in a given case, also influencing your collaboration-appeal, but not necessarily your funding access). More research funding equates to more pull in attracting research students, as well. Internal personal promotion in university settings is commonly disproportionately swayed by high research standing as measured by these research output metrics (balancing quality and quantity). Finally, as contextualised at the start of this article, most academics want to do research; that was why we became academic geologists in the first place.

It has been observed, however, that the pressure to publish has been seen to lead to one of two contrasting outcomes. A study of economics research outputs in Eastern Europe showed that in response to the modern “publish or perish” (publish or lose all access to research funding, and also possibly your job) ethos has resulted in an enhancement in research behaviour; publishing in a wider range of journals in larger quantity, and with correspondingly enhanced citations and journal impact factors. However, many academics have chosen the dark side, and adopted the use of local and predatory journals as a means of meeting research expectations. We move now to an examination of how research journals operate in this context.

#### ***How do journals sustain themselves?***

Scientific research journals require some level of financial support, whether they produce shiny hard copy outputs for libraries or exist only online. As of 2015, it is reported that the annual revenue of the academic publishing industry was in excess of US\$25 billion, and that slightly more than 30% of the global research budget was spent in publishing and in accessing published material (Farquharson & Wadsworth, 2018). They also noted, incidentally, that US\$1.9 billion was attributable to the unpaid costs of peer review, which provide the quality foundation of the publication process, a service that is conducted almost exclusively by academic researchers (and for free). Journal processing charges in the Earth Science are commonly



on the order of US\$1000 (over R18,000 at the current exchange rate), and for higher profile journals, significantly more (US\$5-30,000!), with the average hovering in the neighbourhood of US\$4000 (R72,000) per article. The Research Office at my current institution will pay a maximum of R30,000 for publishing charges; this immediately eliminates a large number of possible research destinations from consideration (unless you are sharing costs with coauthors, which of course diminishes the returns to each institution locally).

However, not every paper you submit is asking you for this kind of money; if those are the real costs, why not? The answer appears to be a mixture of variation in real costs; some journals are subsidized by other income sources, and alternative means of revenue generation. Subsidization can take the form of income derived from professional society membership (or other, such as conference earnings) fees, industry or government sponsorships, combined with reduced overheads (minimalist editorial operation, no print versions). Alternative revenue sources include tolls (access charges) at the publisher site, journal and/or related professional society subscription fees, and institutional subscriptions. These are not simply allowing you to download papers from your university library at no cost to you, they are also subsidizing the publication of those papers in the first place.

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*Sample of a typical "toll" insert from an actual journal (The American Mineralogist, in this case).*

#### How do journals promote themselves?

*Ease of access:*

Safety in numbers:

Association by medium: giant publishing houses; Elsevier, Springer = on the order of 3000 journals each, accessible on platforms such as ScienceDirect. Volumes

of *Geochimica et Cosmochimica Acta* or *Earth and Planetary Science Letters* (for example) can be purchased for or by your library at prices on the order of US\$500-600 per volume.

Association by discipline: the GeoScienceWorld approach: 55 geoscience journals (representing 34 publishing societies) under one umbrella. US\$12,000 annually for an institutional subscription.

#### *Open access*

Open Access fundamentally means that published research is made accessible at no cost to the user. The Berlin Declaration of 2013 (to which our NRF is a signatory, as well as are many of our tertiary institutions) espoused this principal, with the intellectual rights of publications protected through the utility of an embargo period of not more than one year after publication. So for a year, you can only access the paper through its original publisher, but after that, it can be found in institutional or national repositories. The development of the Open Researcher and Contributor ID (ORCID), now widely applied during any publication process and to NRF-related activities, pertains to facilitating this (RU Library, n.d.). There are several levels of open access, in practice. For example, Gold Open Access journals allow access immediately from publication (typically online these days, so you needn't wait for the print copy). Fully Gold lets you download articles for free, but charges the authors an article processing charge in order to facilitate this; Hybrid Gold journals require some sort of user payment for access.

In the Gold Open Access variants, the models are variants on the traditional peer-review publication gateways, but with flexibility in the financial compensation models. There are a number of alternatives in which independent (i.e., not derived from the authors or publishers) financial subsidisation combined with flexibility in peer-review criteria can facilitate access, typically at the cost of dependable content robustness. Green Open Access involves the submission of publications to accessible repositories by the authors (following publisher embargo periods). Postgraduate theses in university libraries fall into this category, for example. Diamond Open Access journals offer preprints (not yet peer-reviewed) from a bespoke repository. The quality control is then provided by an



# THE CANADIAN JOURNAL OF MINERALOGY AND PETROLOGY



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*The Canadian Journal of Mineralogy and Petrology* is a hybrid journal offering both subscription and **GOLD OPEN ACCESS** options, and can be accessed on Geoscience World, as well as through membership in the Mineralogical Association of Canada. We also feature accommodating page charge policies and relatively research-friendly rates.

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independently-funded (membership dues?) editorial board only, for example. Platinum Open Access involves neither author fees nor access fees, and does this through independent subsidization of their publishing process, typically through professional membership charges or tax-funded government agencies.

#### *Proactive publishing: Predatory journals*

Our Research Office describes these as journals that will usually invite you to submit papers and promise speedy publication timelines. In addition, of course, there are normally significant publication charges (tens of thousands of Rand, typically). However, these practices alone do not make a journal necessarily predatory. As can be seen from the preceding paragraph on Open Access journals, the transition from accredited journals (that you maybe can't afford to publish in or access) through the various compromise versions into what would qualify as a predatory journal becomes relatively misty. There are indeed journals which very proactively solicit papers, often offering financial incentives through special issue guest editorships, and offer relatively quick review processes, but the peer-reviews can be robust and the papers important in a given case. It may then be predatory and probably unreliable, but also valuable and useful. It is likely a fine line.

From there one can journey into the land of journals who actively promote self-citation of their journal to artificially enhance their impact factors, and on to artificial intelligence (AI)-generated publications and even journals, where the whole artifice is a construct designed to enrich curriculum vitae disguised as research. We will not be going there (apart from the fact that elsewhere in this issue, I have tasked ChatGPT with writing a short new mineral announcement for me. I have not submitted this for publication, however.)

#### **Implications of research incentive funding**

There are two main paths for the dissemination of research funding in South Africa as incentives to promote research quantity, with the intention being that quality is not overly compromised in the process. These consist of the NRF incentive funding programme

for rated researchers, and the previously mentioned DHET publication incentive programme.

#### ***Incentive Funding for Rated Researchers (IFRR)***

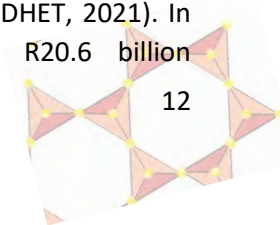
The NRF encourages South African-based academics to apply for a formal rating through peer-review according to various research criteria. This entitles the ratee with recognition of their research status over a six-year term during which they are eligible for some annual funding support, and access to rated researcher grant funding. The latter means that rated researchers have access to a larger pot of research funds to which they can apply annually for research funding, ideally as part of large multi-institutional multi-disciplinary programmes with training of South African postgraduates prioritised. Unrated researchers can also apply for research funding, but will only be supported once, beyond which they are expected to 'get rated'. The annual support of rated researchers has varied dramatically over recent decades, and in my 25 years in South Africa has changed from ca. R40-120,000 per researcher per year, depending on their rating grade (A, B, C, etc.), to zero, and then back to some version of the earlier sum but now spread over the six years instead of annually, casualties of the increasing numbers of diners from a relative static sized financial pie.

#### ***Research Incentive Policy (RIP)***

The unfortunately acronymed research incentive policy funding mentioned earlier in this article has proved to be both a blessing and a curse on South Africa research culture. This is the funding distributed by the DHET to tertiary academic and research institutions according to research outputs and postgraduate degree graduations.

#### *How is it credited to researchers?*

The fundamental premise here is that one (1) research publication unit accrues per each ISI-rated or accredited output. The actual financial amount varies annually based on the total funding available divided by the total number of accredited outputs amongst whom that funding must be shared. In practice, the Rand value of the research subsidy pot has increased annually, but its "real" value has remained essentially constant over the past two decades (DHET, 2021). In 2021-2022 the government made R20.6 billion





available towards Research and Development conducted outside of government institutions, including universities, consultants, public research institutions and science councils (and about half that again was directed into governmentally-housed research and development) (DSI, 2022). The implication of this statement would seem to be that the Council for Geoscience is funded as a non-governmental body, competing with universities, etc., in the context of research and development allocation. Having said that, the current value of a research unit is in excess of, but on the order of, R100,000.

This money is then divided strictly according to institution as represented by author listing and affiliation. So if I publish a single-author paper with my affiliation listed as that of my employer at the time of conducting and publishing the research (the premise being that this institution supported the production of said research), then my institution will receive that R100,000 a couple of years later. If I publish with one other coauthor from another different South African university, the amount will be split evenly between the two institutions. And so on. (I am advised that historically the financial split was credited according to the stated contributions to the paper, so the first authors might get a larger share than the last author who checked the spelling, etc. This would have been fraught with potential inconsistencies and extra labour on all parts, so it's easy to see why this vanished. Also, not all science disciplines use authorship order in the same manner.) For authorships that cannot be credited to the South African research pool (foreign or corporate authorships, for example), that money is retained in the DHET system.

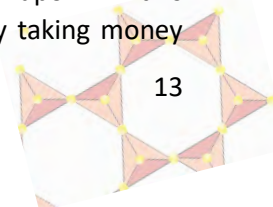
#### *How is it distributed?*

The RIP funding is distributed to the credited institution. From there, depending on the predilections of the given institution, it may be variously dispersed where it is seen to do the most good, with the underlying goal being the further promotion of subsidisable research (i.e., incentive). The destinations for the subsidies may include some or all of the following: university research office (or equivalent division), faculties, departments or schools (typically collections of former departments and institutes), down to individual researchers (for use in their

research accounts, conference travel funds, and in some cases to their personal accounts). There has been much debate about how effectively this translates into the facilitation of research and of a research culture. Institutions (such as my current employers) who distribute the money to the Research Office level subscribe to a more socialist philosophy, where the many benefit from the efforts of the few in the form of annual research stipends and travel grants, recognising that not all fields are equally amenable to output production, and that those who teach a lot but produce less research are facilitating the higher research outputs of their more research-intensive but teaching-light colleagues (particularly those with Research Chairs). In many other institutions, research outputs translate much more directly into the facilitation of more research, but potentially at the cost of quality. Muthuma & McKenna (2020) have noted that the direct subsidisation of researchers will lead inevitably to the increased risk of optimisation of quantity at the expense of quality, and a corresponding increase in the activities of predatory journals taking advantage of this direct linkage between publication money supply and demand, at the expense of actual knowledge exchange, the putative purpose of the activity in the first place.

#### *Implications for collaborative research, beloved by funding agencies (for projects & equipment)*

One of the main implications of the dependence of institutions and researchers on RIP funding in terms of driving research culture are obvious; if it doesn't make money, it is not worth doing, from an institutional perspective (specifically in the context of research outputs). This means that research activities that lead to publications in non-accredited journals, the vast majority of conference outputs, poster presentations at conferences (for which my institution does not provide any institutional support), and collaborative interactions not specifically project or paper driven, are discouraged. Even more dramatically, collaborations with colleagues at other institutions are discouraged, either passively or actively, as this takes money out of your pockets, figuratively and/or literally. My own experience (not at my current institution) is that collaborations with co-workers at other South African universities are particularly frowned upon in this context, inasmuch as you are not only taking money



from your own institution, you are giving it to “the competition”. Losing that money back into the pot by collaborating with overseas institutions seems to be more graciously accepted as the price of research. This institutionalised attitude promotes the historical perception of inter-institutional competition rather than cooperation, and is unhelpful in driving a modern constructive research culture forwards (particularly given the gap between access to research funds, students, time, and analytical equipment between domestic institutions).

Lastly, you may be wondering what an open source journal is? Open source means that the code for the software is available and accessible, and the term has nothing to do with journal publishing (i.e., “open source journals” are not a thing).

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## The Cost of Academic Publishing:

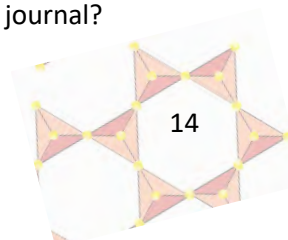
### Page Charges, Article Processing Charges, and Effects Behind the Scenes

**Mackenzie Parker**

*Managing Editor*

*The Canadian Journal of Mineralogy and Petrology*  
(formerly *The Canadian Mineralogist*)  
[parker2814@gmail.com](mailto:parker2814@gmail.com)

It seems like the world of academic publishing, journal publishing in particular, is getting more complicated every day. There are thousands of journals out there, with new ones popping up all the time. Authors are presented with an array of publishing models, from traditional subscription journals to an often bewildering variety of types of Open Access, and the cost to the author of publishing in these journals can vary from nothing at all to thousands of dollars. Where does this variation come from, and how do these different models affect your choice of journal?



Every journal bears expenses: typesetting, printing, online hosting, and staff to manage these processes, just to name a few. In the traditional journal publishing model, the income necessary to cover these costs (and, in the case of a commercial journal, generate a profit) is spread over two types of income: subscriptions purchased by readers and page charges paid by authors. Readers must purchase a subscription in order to read the articles, but page charges to authors are typically optional—although the publisher encourages the author to support the journal, their article will still be published if the page charges are not paid. The proportion of authors that pay their page charges varies from journal to journal, but roughly varies between 25 and 40%.

The Open Access journal publishing model comes in many varieties, but the type which is being most aggressively pursued by a number of agencies and organizations (including cOAlition S, a group including the World Health Organization and many others) is Gold Open Access. In this model, the article is immediately made available to all readers free of charge. For the vast majority of Open Access journals, the costs of publication are recovered via an Article Processing Charge (APC) which is paid by the author of the article. Article Processing Charges differ from page charges in that APCs are mandatory—if the author doesn't pay, they are not published.

Generally speaking, APCs are much more expensive than page charges. This makes sense, since APCs must cover 100% of the cost of publication, while page charges only supplement subscription income. However, beyond being comparatively expensive, APCs exhibit a huge variation in range, from a few hundred dollars to thousands of dollars per article. Authors need to exercise a little extra care when assessing whether an APC is reasonable.

The free distribution of research is a noble goal worth pursuing. However, the financial model of Open Access is also easily exploited by organizations more interested in profit than scholarship. In the subscription model, the quality of the articles matters because the publisher makes more money the more readers pay for their product, and readers are less likely to pay for articles which prove to be unreliable or low quality research. In the Open Access model, quality

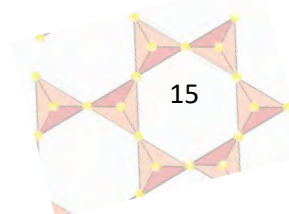
is irrelevant because the publisher makes money not by attracting a high volume of readers, but by publishing a high volume of articles. As long as the author is willing to pay the APC, the content doesn't matter.

Grudniewicz *et al.* (2019) define predatory journals and publishers as: “entities that prioritize self-interest at the expense of scholarship and are characterized by false or misleading information, deviation from best editorial and publication practices, a lack of transparency, and/or the use of aggressive and indiscriminate solicitation practices.” The rise of Open Access has seen a huge increase in the number of these journals.

Predatory journals can often (though not always) be recognized by extremely short review periods and solicitation strategies like producing a large of “special” issues which contain only one, two, or three articles. Predatory journals will also commonly waive Open Access fees for well-established researchers in order to use their names to increase the journal's credibility and attract a greater number of less established or less known authors, all of whom pay APCs.

High quality Open Access journals aren't blind to the barrier that expensive APCs can introduce to publishing, and there are efforts to reduce these barriers that may lead to two authors paying a different APC to the same journal. Publishers may negotiate agreements with universities, libraries, or other academic institutions that arrange for the institution to contribute financially to the publisher's publishing costs. Because publishing costs are now shouldered by the institution, the members of that institution benefit from APCs which are either discounted or even completely eliminated.

Agreements of this nature are financially and legally very complex, which means that they tend to provide the largest benefit to both large academic publishers, like Elsevier and Springer, and large academic institutions or groups of institutions. As a result, small academic publishers who don't have access to such agreements tend to charge higher APCs. This is also why small publishers are more likely to maintain a hybrid model (partially subscription, partially Open Access).





Of course, there are many other elements to consider when evaluating the cost of journal publishing, but hopefully this has shed a little light on where some of these costs come from, and their benefits and pitfalls.

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## Other Gems

### AI and the geosciences

In light of the recent appearance of artificial intelligence text-constructing software which has the academic world in a tizzy since the start of this year, particularly with reference to ChatGPT, accessible and user-friendly software available since November 2022 (and already being supplanted by various alternatives), I decided to see what it could do for me in terms of mineralogy. I gave it the following instructions, and what follows is the article it provided within a few minutes. This is followed by a short analysis of the shortcomings of the offering.

#### My request:

**Can you create an article describing a made-up brand new mineral, named steveprevecite? It should also include where the mineral was discovered and by whom, the chemical formula of the mineral, and some information on its XRD spectrum.**

#### And the product:

#### **Steveprevecite: A Newly Discovered Mineral with Unique Properties**

A team of geologists led by Dr. Jane Smith recently announced the discovery of a new mineral named Steveprevecite. The mineral was discovered in the mountains of the Great Basin region of the United States. It was named after Steve Prevette, a passionate mineral collector and generous donor to scientific research.

#### *Chemical Formula and Physical Properties*

Steveprevecite has a chemical formula of  $\text{Ca}_4\text{Al}_4\text{Si}_4\text{O}_{20}(\text{OH})_4 \cdot 6\text{H}_2\text{O}$ . The mineral has a unique crystal structure that distinguishes it from other minerals. It is classified as a phyllosilicate, which means it is a mineral with a layered structure. It is a white or pale green mineral with a pearly or vitreous luster. It has a Mohs hardness of 2.5 to 3, which means it is relatively soft.

#### *XRD Spectra*

X-ray diffraction (XRD) is a powerful technique used to study the crystal structure of minerals. The XRD spectrum of Steveprevecite showed a unique pattern, indicating its unique crystal structure. The mineral has a monoclinic crystal system with a space group of  $C2/m$ . The lattice parameters are  $a = 20.98 \text{ \AA}$ ,  $b = 9.43 \text{ \AA}$ ,  $c = 11.61 \text{ \AA}$ , and  $\beta = 110.05^\circ$ .

#### *Formation and Occurrence*

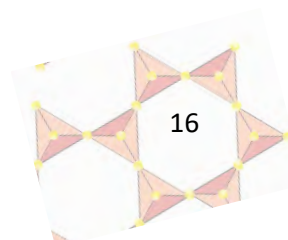
Steveprevecite was formed in the hydrothermal veins of a metamorphic rock called gneiss. The mineral was formed at high pressure and temperature, which led to its unique crystal structure. The mineral is also found in association with other minerals such as quartz, feldspar, and mica.

#### *Significance*

The discovery of Steveprevecite is significant because it provides insights into the geological processes that led to its formation. The unique crystal structure of the mineral could also have potential applications in the field of materials science.

#### *Conclusion*

In conclusion, the discovery of Steveprevecite is a significant achievement in the field of mineralogy. The unique crystal structure of the mineral and its association with other minerals provide valuable insights into geological processes. The mineral could also have potential applications in the field of materials science. Further research is needed to fully understand the properties and potential applications of Steveprevecite.

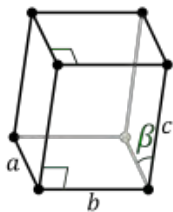


**A few observations:**

First, what kind of a break do I need to get a mineral named after me, if even when I explicitly instruct the software that the mineral is called steveprevecite, it says it is named after "Steve Prevette"? Ok, I could have also instructed the software that it was named after Steve Prevec, but as it is, this is instructive; a mineral named after Steve Prevette would presumably have to be steveprevetteite, as otherwise the motivation to IMA (international Mineralogical Association) regarding the person being honoured would not be correctly followed. Maybe the software is hinting that I have not been a sufficiently generous donor. I'll need to have a word with that Dr Jane Smith.

Other anomalies here that identify this text as the project of AI include the following observations:

- Mineral names are not proper nouns, and as such, should not be capitalised, as the software has chosen to do throughout, in spite of it not being capitalised in my instructions to it, which it should have also noticed, presumably.
- The formula for the mineral as presented is not charge-balanced, as the cations are outbalanced by the O and OH anions ( $8+12+16 = +36$ ;  $40+4 = -44 = -8$  discrepancy), which would be problematic.
- The software has correctly associated the C2/m space group with the monoclinic system, and correctly provided three axes of unequal lengths, with the angle between b and c, correctly represented as  $\beta$ , correctly being not equal to  $90^\circ$ , but in this case over  $110^\circ$ . (image here from Wikipedia entry on "monoclinic crystal system").
- The Great Basin region of the U.S.A. does indeed exist, a geographical term centered around Nevada, corresponding broadly to the Basin and Range geological province. In spite of the name, the Great Basin is bounded by and incorporates mountain ranges, so the apparently incongruity of mountains and basin is also not problematic.



In conclusion, watch out for steveprevecite! If you see it in the literature, you should be very, very suspicious...

**Minsa invites its members to contribute submissions for our next issue of the Geode, on the theme of "Mineral classification paradigms" (see below), for June 2023.**

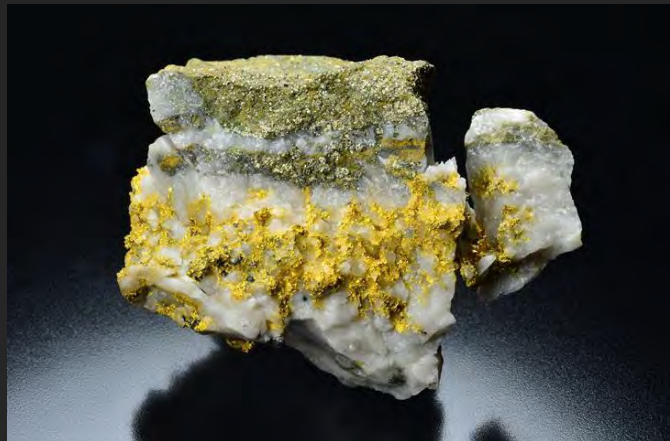
**Submissions can be sent to [minsa@gssa.org.za](mailto:minsa@gssa.org.za) or to [s.prevec@ru.ac.za](mailto:s.prevec@ru.ac.za) and should reach us by 31<sup>st</sup> May 2023.**



**Minerals and mineraloids; When does a mineral solid solution become a mineral group? What is the place of macerals/mineraloids/others in geological/mineralogical classification? For instance, why not classify the "Mineral Kingdom" into Mineral, Maceral, and Mineraloid phyla, thereby introducing a higher order classification to reconcile and make more consistent our classifications along the lines of biological schemes? Whatever happened to sphene? Is steveprevecite a real mineral?**

**Bruce's Beauties: Gold**

The photo feature in the previous issue of Geode featured diamonds, so it seems appropriate to follow it up with gold. All examples shown here are either housed in institutional or museum collections, who requested anonymity. They come from various localities in South Africa and Zimbabwe.



An old specimen from the Robinson Deep mine, Witwatersrand goldfield, Johannesburg. Gold is disseminated in white vein quartz and is associated with layers of pyrite, 8 cm. Bruce Cairncross photo ©.

At right, bright yellow gold dispersed in white vein quartz. Globe and Phoenix mine, Zimbabwe, 4.2 cm. Bruce Cairncross photo ©.



Above, an historic 1895 gold specimen from the Rose Deep Ltd mine, Witwatersrand goldfield, Germiston. Hand for scale. Bruce Cairncross photo ©.

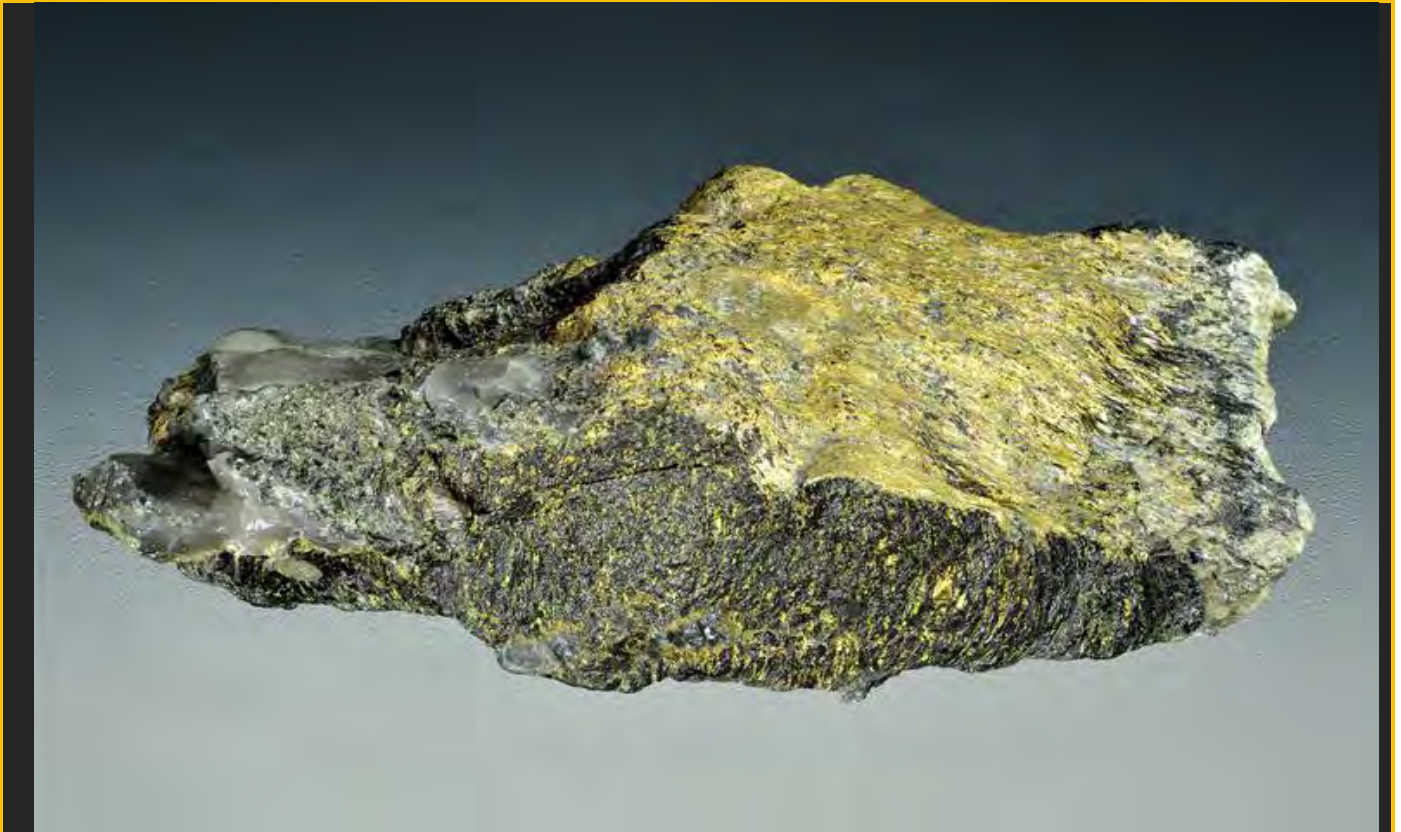


Spongiform gold, acid-etched from quartz, 7 cm (92 gm). Sheba mine, Barberton. Bruce Cairncross photo ©.



Small gold specimen from the Golden Osprey mine, Giyani Limpopo Province. The gold is 8 mm. Bruce Cairncross photo ©.





The final picture is of gold smeared on the upper surface and incorporated within the Basal Reef pyrobitumen, Loraine mine, Witwatersrand goldfield, Welkom, 13 cm. Bruce Cairncross photo ©..

**Do you have an analytical service relating to sample preparation, mineral analysis, mineral extraction, or mineral identification?**

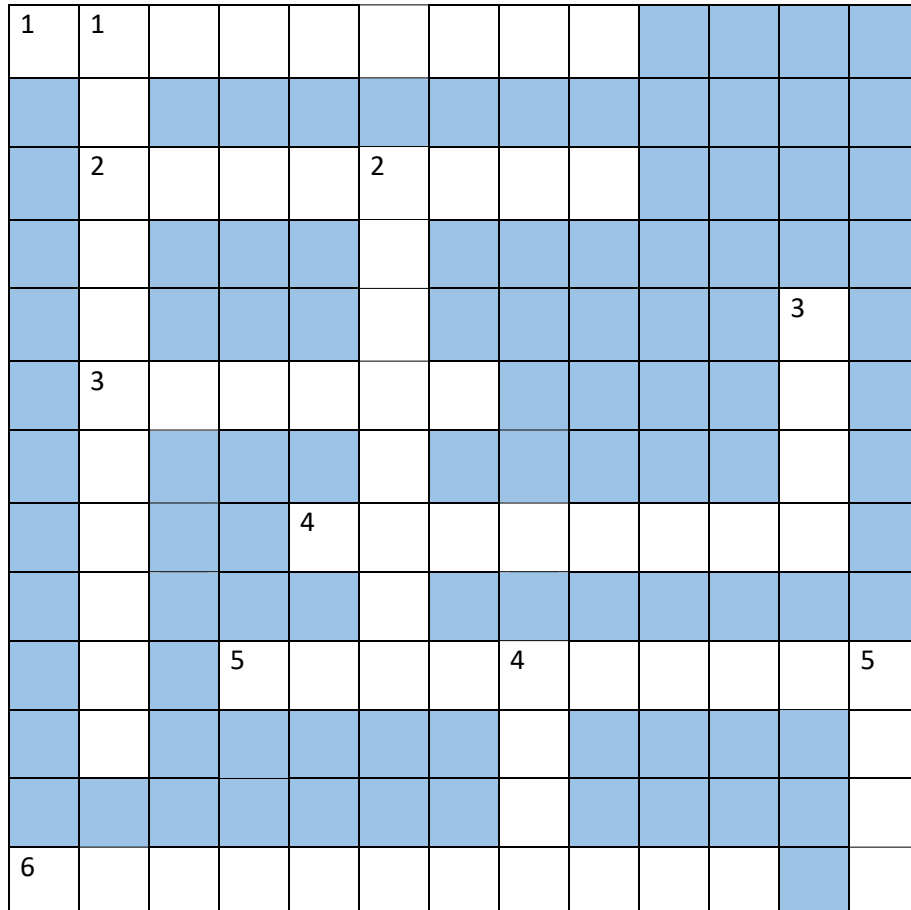
**Do you have capacity to conduct additional services and to get paid for it?**

**If your answer to any of these questions is “yes, I guess so”, then you could be advertising in this space at very reasonable rates, making some revenue, and contributing to the geoscience economy of the nation. What are you waiting for? Right now, someone else is making the profits you could be making, stealing your business!**

**So get busy!**

## Minsa Crossword for March 2023

The theme is obsolete and/or discredited mineral names. Like the brontosaurus, many well known mineral names of your youth have been rendered obsolete by competing names, recognition that they are but way stations in the solid solution sequence of life, or replacement by less colloquial, more specific names. (P.S. Don't despair; the brontosaurus has been resurrected, albeit in a more restricted form).

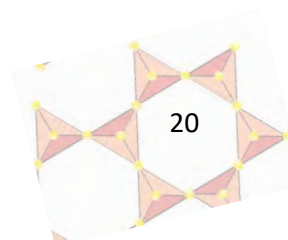


### DOWN:

- One of two clues here referring to low-Ca orthorhombic pyroxenes, this mineral name was discredited as superfluous in 1988, inconveniently in the midst of my postgrad studies, referring to a ferroan enstatite of either igneous or metamorphic origin.
- Referring to the same mineral as in 1-DOWN above, this term was widespread in the mafic intrusion literature along with 4-ACROSS, and referred to the mineral colour on cleavage surfaces, especially when weathered.
- The prefix of \_\_\_\_stone, the name given to iron oxides with specific reference to its power to attract, in the 16th century, and reflects its use as a navigational aid in compasses.
- I apologise for this one in advance; I needed a linking word. The colloquial term for the amount of time until the announcement of the replacement of the name platarsite for S-rich sperrylite in an imminent issue of the Canadian Journal of Mineralogy and Petrology.
- The prefix of \_\_\_\_stone, for the gem version of adularia, also known as hecatolite. Its colour comes from light refracting through alternating layers of orthoclase and albite (see also 'solvus').

### ACROSS:

- The iron carbonate ore, often associated with fluorspar and pearlspar (two other archaic mineral names, for fluorite and for shiny dolomite, respectively).
- Archaic name for graphite and molybdenite, and more recently for miscellaneous lead ores. Now exclusively used for a plant with lead-like colouring.
- The Ca-Ti silicate mineral common in amphibolites, this name was formally discredited in 1982 and replaced by titanite, but is still widely used for the gem version, and in general.
- The little-used name for clinopyroxenes at the augite-diopside join, common in igneous literature from the 1960s but no longer perceived as a distinct species of the solid solution series.
- The original German name coined by Werner (the famed Neptunist) for the magnesian clay mineral sepiolite, it is now found most commonly in reference to clay (tobacco) pipes, more than in the geological literature.
- Also originally named by Werner for its occurrence at an active Neapolitan volcano, it is now most commonly known as idocrase.



**Minsa Crossword solution for December 2022**

Last issue’s crossword theme was clay minerals, in keeping with the issue itself. Here are the solutions.

|     |     |     |     |   |   |     |   |     |   |     |
|-----|-----|-----|-----|---|---|-----|---|-----|---|-----|
|     |     |     | 1 A |   |   |     |   |     |   | 2 S |
| 1 B | E   | N   | T   | O | N | I   | T | E   |   | Y   |
|     |     |     | T   |   |   |     |   |     |   | L   |
| 3 C |     | 2 S | A   | L | M | I   | A | 4 K |   | V   |
| A   |     |     | P   |   |   |     |   | A   |   | I   |
| L   |     |     | U   |   |   |     |   | O   |   | T   |
| 3 C | H   | A   | L   | K |   | 4 H | A | L   | I | 5 T |
| I   |     |     | G   |   |   |     |   | I   |   | E   |
| T   |     | 5 P | I   | C | A |     |   | N   |   | E   |
| E   |     |     | T   |   |   |     |   |     |   | T   |
|     | 6 S | M   | E   | C | T | I   | T | E   |   | H   |

**DOWN:**

1. A type of fibrous magnesian palygorskite clay, it is one of the compound known as “fuller’s earth” for its ability to extract the colour from oils or other solutions. It is mined prominently in southwestern Georgia, where its name comes from the local indigenous word meaning “dogwood”.
2. The “other salt”, it used in much the same capacity as #4 across, with which it is isomorphous, and features a tangy, more bitter taste than its counterpart. It is the official mineral of the Canadian province of Saskatchewan.
3. The principal mineral constituent of lime, which itself acts as a neutralising agent, reducing stomach acidity.
4. The most cation-free clay mineral, which does not contain potassium in spite of its name, and is widely used as an anti-diarrheal remedy, both artisanal and commercially. It is named for the town in southeastern China from which porcelains made from it attracted the attention of 18th century European visitors.
5. The porcelaneous fluorapatitic body parts through which all geophagous materials must pass, and which will end up contributing irreplaceable phosphate to your system if you grind them down chewing on quartz-bearing clay-rich soils.

**ACROSS:**

1. A variety of montmorillonite, this aluminous clay is eaten as a paste and extracts harmful metals and aflatoxins, mold-generated chemicals which are toxic to the liver. It is named for its largest deposit, in Wyoming.
2. An inorganic salt, NH<sub>4</sub>Cl, this is the prime flavourant in Nordic salty liquorice.
3. A mineral compound eaten for its kaolin content particularly by pregnant women from West Africa as a treatment for morning sickness (nausea), the “calabash” variant derives from fossilized sea shells.
4. Probably the best-known ingested mineral, this ionic compound known as rock salt is widely used as a flavourant and a curing (preservative) agent in meat, in particular.
5. The name for the disorder in which materials not normally considered to be food are craved or eaten.
6. The name for the group of alkaline three-layer swelling clays (including or synonymous with montmorillonite, and also with #1 across), which can absorb up to 30% of its weight in water (much like myself).

*Note: The recommended deadline for submissions for the next issue of the Geode is May 31, 2023.*

