

Health custodians

The Guest editorial by Kartha¹ has gone deep into the roots of medical education in our country since independence. One becomes a specialist after several years of reading a particular subject or practising a profession for an extended time. When doctors are trained, the intention of such training is to make them useful to society. Thus, during the training period doctors should be taught subjects, the knowledge of which they can use for the betterment of society. What they read and what they practice should be the same for doctors to gain proficiency in the area of their functioning.

Hippocrates has said 'Whosoever wishes to study medicine well should proceed thus; in the first place to consider the seasons of the year, the waters, the ground, the mode in which the inhabitants live and what are their pursuits, whether they are fond of eating or drinking in excess, given to sedentary life or are fond of exercise or labour'.

A modern-day medical student has to study during his curriculum, outdated meth-

ods and also newly emerging 'not too sure' concepts which change almost every two years or less and all the newly emerging medical specialities. He is definitely more burdened than his counterpart of previous decades. One criticism regarding medical education is that the students are not examined for their communication abilities, ability to perceive patients' sufferings, ability to empathize and ability to establish a rapport with their patients. All these need to be not only taught but also examined before certifying a student and sending him to the community; these abilities are essential for better patient care. It appears we are merely manufacturing more academicians and not those who would be useful to the community. Medical profession is already in the grips of globalization and it appears that we are training prescription-writing machines and not really those essential to the community. The number of subjects they have to learn has increased considerably as also the number of medical colleges in our country, and teachers of specialities demand that there

should be an examination of that speciality, thus further increasing the burden on the medical student. Therefore good planning is required to prepare the health custodians of our population, and increasing the number of subjects will be of little use. It would be useful to the nation that the MCI and Government refrain from adding subjects like ayurveda and homeopathy to the medical curriculum, in addition to what is already being taught. In fact, interested students can learn those subjects after the completion of the their courses.

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Impact factor: Is it dragging science off course?

We are witnessing an exponential growth of scientific literature in recent times. 'Documentary chaos' is what Samuel C. Bradford, former librarian of the Science Museum in London said is happening in the field of scientific literature, referring to its exponential growth. But the assessment of scientific quality is a difficult task. The general trend was to use paper counts, importance of the journal, etc. But in the past three decades impact factors (IFs) and citation indices are being used at the international level.

So what is an IF? The IF for a journal is calculated by dividing the number of current citations to articles published in that journal in the two previous years by the total number of articles published in the journal in the two previous years.

IF judges the journal more effectively than the contributor or author, but it is also wrong to say that scientific content has a secondary role to play; in fact, it is the classical chicken or the egg story. An author

selects a high impact journal for his/her contribution and in turn the contribution is what increases the IF of the journal – a vicious circle of sorts. Journals have reputation, but their stature is only derived from the usefulness of the articles they publish. Evaluation of journals is a formidable but indispensable task considering the wide range of choices available, but again arbitrary evaluation of scientists based on the prestige of journals is a moot point.

The question is what does the IF indicate – quality of the journal, quality of the scientist or quality of science? One must agree that it does indicate all three, but the degree of importance varies with the decision-maker. The vertical flow of the connection between the three is undoubtedly: science > scientist > journal. Let us consider how each of these can be evaluated.

Taking journals first, it should be noted that the decision-maker with respect to

this criterion is the fund allocator or the library advisory committee, which essentially takes a decision on which journal to buy and which not to. By its very definition and its explanation, journal IF is a form of measurement used to determine the relative standing of journals in a particular field. Review articles are heavily cited and inflate the IF of journals. Annual reviews therefore qualify easily to get into any science library being state-of-the-art. Inversely, state-of-the-art science gets into the high IF journals and these journals ideally are the ones that should adorn the library. So inasmuch as the marketability of the journal is concerned, IF definitely is a prime criterion. This very fact has led to less scrupulous practices by editors to increase IF. Increasing citation by crooked means is one such method; it starts from the editor and goes down to the prospective author. Many journals, of late, run editorials citing their own journal. Some journals request authors

to cite them in the guise of relevancy to the journal. What is more is that the prospective author, in order to increase the chances of acceptance of his/her article, cites more articles from the journal he/she is submitting it to.

On the other hand, the relationship is quite complex when considering scientists, science and IF. The initial idea of Eugene Garfield to identify which journals mattered the most to scientists, is much distorted now. In fact, IF is playing a crucial role in employment, promotion and awarding of grants. The first objective of the researcher would be to publish in a high IF journal, by which, irrespective of the quality of material published or citation of his/her work, the researcher gains a quantum advantage¹. Increasing awareness about journal IF and its use in academic evaluation is already changing scientists' publication behaviour towards publishing in journals with maximum impact, often at the expense of specialist journals that might actually be more appropriate vehicles for the research in question². The second is that a researcher tends to cite his/her work more to gain citation advantages and if a subsequent self-citation gets into the same journal, the editor is also pleased. The consequence is that the priority of publication becomes more important than the quality of research itself. The scientist, according to his/her ability can get into a high IF journal without actually making a significant contribution to science.

In essence, it should be borne in mind that citation does not automatically mean

that a work is of high quality. A work may be highly cited because many other authors are refuting the research findings it contains. Basically, IF is a measure of average citation impact, not individual citation impact, so an IF cannot be used to measure the performance of an individual.

On the contrary, not all research work is published and cited in the citation indices: conference proceedings, for example, are often poorly covered. Hence peers should exercise extreme caution in ranking scientists on the basis of IF alone. Now looking at how science itself is affected by the fuzzy maths of IF, we see that high impact journals call for papers to be topical, and to present important science. Hence scientists are changing the kinds of questions they investigate to accommodate these journals, an attitude that in a way takes science off course. This can lead to results of key experiments being published in such a way as to optimize the sum of the IFs rather than the effectiveness and value of scientific content³. There is a clear bias in favour of English language material on citation indices and it seems that the medium of publication can skew the path of science⁴.

In India, National Academy of Agricultural Sciences (NAAS), New Delhi has come out with ratings for different journals which are being accepted by research organizations such as the Indian Council of Agricultural Research, New Delhi. This effort is commendable in that it is a beginning and Indian journals that do not find a place in ISI have been rated too. Another advantage is that the assessment

of scientific research on the basis of the impact of individual publications/journals will auger well for quality of research instead of a game of numbers – the more you publish, the better it is. But caution is again required as the list is not exhaustive and many reputed journals do not find place in the rating list, which we assume would be dynamic, as lists are announced for individual years. Again, in contrast to ISI, where a clear-cut formula exists for calculation of IFs, the basis of NAAS rating is unclear. Citation analysis and journal IF can be a worthwhile criterion for evaluating publication records of individual scientists or research units with some amount of flexibility to suit the field of research. Although at the international level, the ISI Thompson is working to make it as flawless as possible, the question is whether science has an alternative to evaluate itself and the people who are shouldering it.

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Volcanic ash beds

Kumaravel *et al.*¹ have suggested that the Ghaggar section be considered as a standard stratigraphic section for the Pinjor Formation (near Chandigarh) of the Siwalik Group. They have used the reported occurrence of volcanic ash beds from Ghaggar river section as the benchmark and, further based on fission track zircon age (2.14 ± 0.5 Ma) from the reported ash bed, the Gauss–Matuyama polarity reversal and lower limit for the Pinjor Formation have been constrained. Our comments pertain to the following points: (i) validity of ash

beds; (ii) reliability of zircon age, and (iii) Not citing inconvenient published work.

(i) Based on mineralogical, petrological and geochemical studies, the volcanic nature of the so-called ash beds has been negated^{2–6}. This is due to the following reasons:

(a) Absence of glass shards, pumice fragments and high quartz in these rocks.

(b) The zircon separates from the ash beds are clear, zoned with elongation ra-

tios (1.41 to 9.48). These features are suggestive of magmatic origin. Some are reworked also. They do not show volcanic characters.

(c) The biotites are of metamorphic source.

(d) Heavy minerals such as epidote, rutile, topaz, kyanite, magnetite, ilmenite and hematite, separated from these rocks are reworked.

(e) Paucity of trace elements such as Ni, Cu, Cr and Co in these rocks indicates that these reworked sediments were