



Commentary

ENGLISH – THE GLOBAL LINGUA FRANCA OF SCIENCE

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*This commentary deals with two closely related issues; what English has done for Science, and what Science has done for English. From the perspective of the present-day publication industry, there is little understanding and even less appreciation of this symbiotic interaction in what has happened over less than a century. The issues involved are discussed and illustrate the huge importance of a continuing trend that bodes well for the future. **Biomed Rev 2025; 36: 131-133***

English has done wonders for Science, and Science has done wonders for English.

1.1 ENGLISH USAGE

In a world of over 8 billion people, ~14% fourteen percent have English as their native or first language. It is nowadays, however, spoken as a second tongue by several billion. On international flight the language first used is of the country operating the service, but if this is not English, then is followed by announcements in English, as occurs in other situations, not just air travel, as clear from the worldwide use of English by the media.

The reason for the global use of English is probably due largely to the fact that for centuries the British colonized large tracts of the world of continental size, outstripping others (Dutch, Portuguese, French, German, Spanish) by far,

remembering this includes America. In their governance, English was being used almost exclusively. Countries with large populations, such as China and Japan did not take control of large expanses abroad, remaining relatively insular.

1.2 THE EMERGENCE OF ENGLISH

English today is the result of a language that assimilated, adopted and adapted words that originated from a multitude of other languages, with over 20 roots. Many books have been written on this subject, but for a short overview, that of Simon Horobin (*How English Became English – A Short History of a Global Language*; ISBN 978-0-19-875427-5), is recommended. It is truly astonishing to consider how this

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was achieved, notably over the last Millennium or so, but it undoubtedly resulted in a highly flexible language, far richer than many others. It meant that alternative names could be used for similar things, but with very subtle differences, resulting in a truly enormous vocabulary. For a quick example, take the 3-letter word *set*; in even the standard dictionaries of English (e.g. Cassell; Oxford; Chambers), almost a whole column is required to give the wide variety of its usage. However, this also makes English a very challenging language.

1.3 LEARNING ENGLISH AS A SECOND TONGUE

One quite surprising thing is the speed with which many foreigners learn to speak English, despite its complexity. No one seems sure why this should be the case, but as English is used so much throughout the world, it certainly seems to rub off quite easily onto others of different tongues. Constant exposure clearly plays a significant role in being able to communicate in *spoken* English, but less so regarding *written* English.

1.4 OBLIGATORY USE OF ENGLISH IN SCIENCE

Herein, there is one main issue to discuss and evaluate, which is the way in which it is now more-or-less obligatory to write scientific publications in English, making them available globally. Prior to the second world war, scientific papers were being published – at least for the Western world - in French, German, or other languages, summaries being included in different languages for assistance, but that is very much a thing of the past. Papers in Russian, Chinese and Japanese, for example, did not get global exposure. English in due course, and remarkably quickly in the early 1920-30s, became a global lingua franca. Being English, and being educated to speak and write Queen's (now King's) English, I moved into biomedical research in disciplines as a career and have been unduly privileged as I wrote many papers, articles and books, becoming ever more engaged in editing. It is through reflection on this lengthy scientific career starting in the very early 1960s that I make my assessment of the current situation. However, it is because the “body of the kirk” – in English, the vast majority – have probably not reflected on the full significance of the use of English in scientific communication, let alone the speed with which it all occurred.

1.5 CRITICAL EXAMINATION OF SCIENTIFIC PAPERS – THE IMPORTANCE OF REVIEW

The English in which *scientific* papers need to be written must

be precise, accurate and mean exactly what it says. Succinctness, like Ockham's razor, is also an issue; scientific papers that run wildly into speculation or have little or no logic to them are quickly rejected by publishers. But there is one particular issue that needs to be stressed; scientists, doctors, technologists and the like publish many thousands of articles, probably moving now towards millions, a year on a global basis, all needing to be accurate and to the point. Relative to all other international publications, it would not be surprising to find that they are totally outweighed by the scientific literature.

There are also safeguards operating that guarantee the accuracy and validity of all scientific publications, which far outstrip those found on other fronts (e.g. articles on religion, politics, economics, the media, etc.). These are the *standards* set by the process of reviewing papers prior to publication. Where else are potential articles subject to impartial criticism within the author's own domain? The listing of these many stages of this process below emphasises the gravity with which the whole procedure is faced if a paper has a real chance of finally being published:

- a) Colleagues and mentors of the author give their advice (the majority of papers are multi-authored); seminars on the content of the paper are often given at an early stage.
- b) An editor receiving a submission makes a response concerning the appropriateness of the subject matter to the journal's mien, and its general tenure;
- c) If it passes this initial inspection, *two or more independent reviewers* are asked to evaluate the suitability of an article, from its scientific value *and* its presentation.
- d) The editors of the journal then make their own assessment of the merits that will (or will not) end with a final decision regarding its publication.
- e) If it will be accepted the manuscript may pass several times between the editors and the authors, and the final version goes to a copy editor for a final check before it goes to press.

In brief, before publication a scientific paper in common parlance is “put through the mill”; it is scrutinised beyond that expected in almost all other literature. It is hard to imagine that there will be any early turnaround involved in the future global communication of scientific and science-related matters.

Two other possible ways of dealing with international communication on all fronts are worth noting. One was an attempt in the late 1880's to introduce for mainly western Europeans as well as Russian and other tongues a phonetic language called “Esperanto”. A Jewish Pole, trained as an ophthalmologist in Russia, was responsible and while it survived even up to the

second world war, it had a weak following and was disliked by Stalin and Hitler. While the idea was laudable, its practicality was sadly missing.

The second way of approaching the problem of communication is to publish in any language that one might chose, without the paper being subject to the intense reviewing process described above. The idea is that people could publish whatever they liked and wherever they could, it then being up to the *readership* to consider whether a paper had any merit or not. Clearly this open-house notion depended on authors having the ability to act as publishers themselves, which was never going to be a solution to the problem, especially in the world of science. It is also a costly business, which would discourage most would-be authors. But there is nevertheless some demand for a more open approach, and one suitable channel has been the initiative in this direction by Cold Spring Harbor (Biological Revs)

1.6 THE POSSIBILITY OF INTERVENTIONS

There is one issue to be addressed, which involves any foreseeable dumbing down of the situation as it stands today. This relates to the possibilities of changes to the English currently in use by the introduction of adaptations, new words and expressions flowing from the ever-expanding knowledge coming from fields such as molecular biology or quantum physics. Like the recently discovered membrane-bound vesicles, dubbed “hemifusomes”, using cryogenic electron tomography (Tavakoli et al, Nat Commun May2025). The vocabulary today is more extensive than a few decades ago. All must be assimilated in the best possible way with conventional scientific English, but there are some changes that could sully it. Perhaps this is understandable when attempts are made to introduce changes in spelling, and in the introduction of new terms and expressions. Before taking a couple of instances, let me give you my impression of Scientific Literature since I engaged full time in research at the beginning of the 1960's. Comparing papers published in that decade with those now being published 60 years later, I remain quite astonished how the same standards have been maintained for a field in which

greater use of colloquial English could be constantly occurring. However, spelling has not been noticeably altered, although certain words will have been “Americanised”, (neighbor vs neighbour). But colloquial americansims, such as the use of *gotten* instead of *got* have not prevailed. This can be checked by, for example, looking at 20 papers published by Americans in American or International journals. There is one example, however, that will make my point, which relates to the use over the last 1-2 decades of the word “impact”. Like its overuse in the media, it has become a regular word in the scientific literature. But it has served the purpose of getting around the difficulty of using English two words (both being nouns and verbs), namely “effect” and “affect.” In *spoken* English, unless the “e” of effect is emphasised, the two words can barely be distinguished. The following sentence makes the point: *The effect of A on B is to strengthen it; A therefore affects B.* For the non-native (and some native) English speakers, these words remain problematic. Introducing “impact” over the last 10-15 years has in many ways helped solve the problem, as it also can be used as a noun or a verb, although underneath it still retains that hint of violence.

1.7 IN CONCLUSION

The take-home messages, then, are first that Scientific English has been globally accepted for many decades, has remained in the best of form with little interference. Its versatility has far outclassed anything that could be achieved with other languages. We could move on to calling it “International English”.

And second, English has helped Science achieve its wonderful accuracy and clarity in international communication today, and it is likely to be in charge for the foreseeable future. To this we must also recognize that the vast scientific literature that is being published today does not get expunged, i.e. papers are a permanent record, each meeting the test of time as our knowledge advances. Finally, by drawing attention to these matters, it is hoped that readers will more fully appreciate not just what English has done for Science, but what Science has done for English. And what the renowned scientists have been doing for Both!