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# Plan S and the Information Age

Like it or loathe it, we live in the Information Age. The ability of a seven-year-old to research or find commentary on a complex topic (for example, general relativity) has surpassed that of a graduate student just 15 years ago. This shift has occurred not only due to the expansion of the internet, but also through the development of handheld devices, which have improved the ease – and increased the frequency – of online access. Having knowledge freely available has become the hallmark of our era. While this is undoubtedly beneficial in some respects, we should also pay heed to the adage that ‘a little knowledge is dangerous’. Having access to facts and commentaries does not mean that we understand the topic, and it may often be difficult to distinguish between what is true and what is not. A good friend of mine, an orthopaedic surgeon in Los Angeles, takes his ‘Don’t confuse your Google search with my medical degree’ mug to clinic with him.

Mark Stevenson, author of *An Optimist’s Tour of the Future*, argues that the way we visualize changes and new technologies depends on when they are introduced in our lifespan. For Stevenson, younger people tend to regard new technology as having always been there, whereas those in their middle years adopt technologies that they find personally useful (I use Twitter but have no real use for Facebook, for example), and those who are over 50 years old often eye new developments as a waste of time.

I wrote the first draft of this editorial on an aircraft heading out to Delhi for the ISKSA (International Society for Knowledge for Surgeons on Arthroscopy and Arthroplasty)/BESS (British Elbow and Shoulder Society) Conclave 2019, where, through delivering talks, chairing sessions, and listening to peers, I engaged in some old-fashioned face-to-face

teaching and learning. Part of my reading for the trip was to catch up with the progress of ‘Plan S’, both out of personal interest and because, with the six-yearly Research Excellence Framework (REF) returns around the corner, the alternative was to score a pile of other people’s research outputs! Plan S, for those who are unfamiliar with the initiative, is an ambitious approach to open-access science publishing. The current system revolves around a combination of open-access publishers (such as *Bone & Joint Research*, which operate on an article-processing charge), hybrid journals (like *The Bone & Joint Journal*, where you can pay to have your article open access), and purely subscription-based journals. Plan S involves a group of some of the largest research funders in Europe, who have taken the view that not only do they want their funded research to be published as open access, in order to maximize dissemination and value for the taxpayer, but they also want it to be published in journals that have an entirely open-access model. This approach would destabilize the publishing world and would apply disproportionate pressure to the hybrid journals both financially and academically.

While this might seem like a laudable approach – free knowledge for everyone – it misunderstands the age we live in. For each carefully curated open-access resource, there are thousands of less carefully curated resources out there – even Wikipedia, which is driven by dedicated volunteers, is prone to inaccuracies.

The same is true of academic journals. Few would deny that for each open-access journal like *JAMA* or the *Lancet*, which comply to the National Institutes of Health’s definition of open access (articles are behind a paywall for six months), there are hundreds of ‘Frontiers in’ titles and similar, which are open-access

journals in only the loosest sense of the term. They do not have the same exacting peer review process or editorial standards, and while many carry a mix of good and bad articles, publication itself does not allow the reader to draw any inference on the scientific rigour or content of the article.

Within a speciality like trauma and orthopaedics, more is learned from case series, prognostic studies, registry articles, and retrospective reviews than is learned from randomized controlled trials. A move to make all ‘reputable’ journals open access will strip those journals of the independence provided by the subscription model. In order to fund their activities, they will need to publish articles from those who can afford to do so. A cursory flick through the pages of any edition of *The Bone & Joint Journal* will yield a range of practice-changing articles that have no specific funding associated with them, all of which have been distributed in print to tens of thousands of orthopaedic surgeons worldwide. That is worthwhile in itself, as many of those orthopaedic surgeons are in the same category as me: ‘partial adopters’ of new technologies, as Mark Stevenson would say, while many more readers are averse to non-print formats.

Although Plan S is laudable, it does pose a risk to surgical and medical practice, where much research is observational (i.e. based on what we see happen to our patients). What is certain, however, is that in the Information Age, you just can’t trust what is written quite as much as you used to. While ‘fake news’ has become a calling card chiefly for those who produce it, ‘fake research’ is much more of a reality and even today it is crucial to eye anything from a less reputable publisher with some level of suspicion.