

Current scientific publication

Alfredo Pereira Jr.*

* Associate professor, Department of Education, Instituto de Biociências de Botucatu, Universidade Estadual Paulista (UNESP), São Paulo, SP, Brazil.

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Universities, since they were created, in the Middle Ages, until the mid-20th century, were predominantly institutions that disseminated knowledge. The great inventions and innovations were made, after the 17th century, by independent researchers that gathered in scientific societies.

Such researchers were often entrepreneurs as well, who built machines, were present in the business world, made philosophical reflections and were involved in political movements, such as Benjamin Franklin and Thomas Jefferson in the USA.

Scientific societies were responsible for the invention and disclosure of instruments that revolutionized scientific research, such as pendulums, barometers, thermometers, hydrometers, air pumps, engines and the microscope.¹ The impacts of those inventions are present up to our present time, in which the association between science and technology causes deep changes in human life.

Since the second half of the 20th century, the role of universities has been changing, possibly due to the success achieved by applying knowledge to generate new products and procedures that revolutionize human life. Economic surveys indicate a progressive participation of universities in the generation of innovations that have an impact on the productive system and on varied levels of human activity, such as medical care and health promotion systems.²

In this context, scientific research moves away from its Greek ideal of uninterested search of the real knowledge and takes on a pragmatic role. What is now aimed is that knowledge can subsidize new technologies and practical applications to generate a tangible effect on a given field of human activity. In modern society, called "technological society," "information society" and "automated society,"³ a chain is being formed in developed countries starting in the productive system, where demands are defined, going through research funding and development of products and processes, and going back to the first system as innovations that allow increase in competitiveness by these countries in the globalized world.

In countries that cannot concatenate the productive process with the system of scientific and

technological innovations, there is, instead of a "virtuous circle" mentioned above, a vicious circle, in which the low economic productivity prevents investments in education and scientific and technological research, and absence of relevant innovations in applied knowledge avoids improvement in the productive system.

Such social context implies restrictions and also opportunities for university professors.⁴ In a country like Brazil, a large number of researches could be performed focusing on relevant themes for economic, social and human development, whose results could be applied by means of public, private or "third sector" (non-governmental organizations) mechanisms. As to the health area, research studies that have an impact on people's quality of life could be carried out, especially if there are mechanisms allowing application of these results in the public health system.

Using the considerations above as a starting point, we could better evaluate the importance of academic publications. A publication is nothing more than making the methodology and results of a study public. If the research focused on a relevant problem for the society, it can be expected that such society, through its groups and representatives, becomes interested in these results and in the possibilities of using them to solve problems.

There are currently two lines of thought on the role of publication in scientific career: one believes its role is overvalued, leading to an excess of publications, which have lower quality and number of readers; the other (to which I belong) understands that the publication is crucial for everyone involved in research, and that the means of electronic publication open a new perspective to democratize the process (since nowadays only an elite has access to high-impact journals).

The first line of thought has Mr. Lindsay Waters, at Harvard University, as one of its main representatives. He has recently delivered a lecture on this topic at UNESP.⁵ One of the reasons for his concern lies in the precarious financial status of scientific journals, since the number of authors tends to be higher than that of subscribers. We can see the reflex of that situation in many journals that charge a fee to publish articles, or that force authors to subscribe to the journal in order to have their articles published.

Such situation can be solved by electronic publication, which reduces costs and increases the number of potential readers. Even if there is more offer than demand, use of search mechanisms using keywords (for example, PubMed and Google Scholar) allows everyone interested in a given theme to select articles of interest among those available online. Thus, the message reaches the right people.

Even more important than search mechanisms, interactive platforms have recently been introduced, allowing *online* discussion of *preprints*. For example, *Nature* has been worried about the process of science democratization (side by side, of course, to its corporative *marketing*), launching the website Nature Network (<http://network.nature.com/>), in which, besides publishing *preprints* at the link Nature Precedings (<http://precedings.nature.com/>), mainly dedicated to the biomedical area, scientists can also form discussion groups for themes of interest.

For those who were raised in an environment where publication was already valued, developing since then article writing and formatting skills, all such activities could become sources of satisfaction and achievement. However, for those who started and developed their careers in environments adverse to publication, a simple institutional pressure to change consolidated habits can generate traumas and blockades.

I conclude these reflections indicating that we need to create institutional habits of discussing science, creating new electronic means to disclosure research results, which often remain "in drawers" (as in reports, final papers for undergraduate and graduate courses and essays on free topics). After all, institutions that have high publication rates certainly put some effort in this

sense, creating many mechanisms that facilitated the path from research to publication.

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