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SCIENTIFIC JOURNALS AS A STANDARD OF SCIENCEABILITY

Abstract

Various scientific-philosophical conceptions have introduced and continue putting forward various criteria and factors on the origin of science. This paper aims to highlight the role and significance of scientific journals within the context of the given issue. The article also describes the most common versions of science emergence and outlines a brief history of the emergence of scientific journals. The idea that the emergence of scientific journals in the life of society was not an end in itself but rather an essential and solid step forward to satisfy particular societal needs is proposed in the article.

Keywords: scientific journal, science, the origin of science, scientific periodical, information.

Introduction

The origin of science stands out with a specific significance among issues of particular importance within the framework of the philosophy of science. However, the questions of “when, where and how did science originate?” have never been provided with definite answers. Different thinkers raise different theories. The views on the origin of science are pretty widespread in philosophical studies. If we try to classify and coordinate them, we shall have the following picture:

1. Science has emerged at the same time as humankind’s urge to recognize the surrounding world. That is when man first looked to heaven and asked himself, “what is this?” or “how does all this work?”, this approach laid the grounds for science and scientific thinking (Bernal, 1956, p. 42)
2. Science originated with the written culture, approximately in the 3rd millennium BCE, in Egypt or Mesopotamia. Adherents of this approach find that the invention of writing helped to combine the experiences of previous generations, and therefore it created opportunities to accumulate and transfer knowledge. They argue that even if the origin of science is not to be found here, the roots of prescience lie here (Badak, 2002, pp. 169-170).
3. Science originated at the same time as philosophy. In other words, adherents of this approach consider the first successful attempts to theorize human thinking as the foundation of the origin of science (Averincev, 1989, pp. 67-79; Bondarenko, Ilyashevich, & Martynenko, 2018).
4. The origins of science can also be traced to the establishment of universities in the early Middle Ages. Some thinkers suggest that over centuries these universities have undergone an extraordinary transformation into “purely scientific” institutions, thereby founding a basis for science and scientific outlook (Ignatova & Rimskyi, 2013, pp. 61-65)
5. The origin of science has to be linked with introducing experimental methodologies in cognitive research by Occam, Rossellini, Abélard, Paracelsus, R. Bacon, Robert Grosset, Thomas Bradwardine and others (Grant, 1997).
6. The origin of science must be linked to introducing a systematic approach to scientific research by the 16th-17th centuries, “devotees

of science” through an inseparable combination of theory and experience (Dougherty, 2016).

7. The origin of science should be linked to the process of institutionalization of science, with the introduction of important scientific institutions: Royal Society of England in 1660, Paris Science Academy in 1666, Science Academies in Berlin (1700), St. Petersburg (1724) and Stockholm (1739), etc. (Ogurcov, 2011, pp. 272-273).
8. In the 19th century, science gained academic status through the introduction of the Institute of Practical Seminars in Germany (Demmin, 2013, pp. 240-261).
9. To be true, we should also underline that there is another approach, according to which the above-mentioned points are merely stages of science development, and that the combination of research and higher education in Germany brought the establishment of science to an end (Ushakov, 2005, p. 510).

Interestingly, however, some authors, trying to guess the number of 17th-century scholars, build their assumptions based on the circulation of scientific journals published in this period (Karmin & Bernackii, p. 394). If scientific journals with a circulation of about a thousand are consumed, it must be recognized that the number of scientists interested in and living with scientific innovations should be consistent with the number of journals published. Admittedly, this assertion has a logical basis. Unless there was a public demand, one would hardly have spent the effort and resources to publish scientific journals. This gives us reason to believe that scientific journals have been, and still are, unofficial heralds of science and scientific thinking, if not criteria or, in other words, symbols. Furthermore, here, we dare to propose a unique criterion of the origin of science - *the emergence of scientific journals* as a factor in satisfying the unprecedented public demand.

On the History of the Development of Scientific Journals

It is hard to imagine the modern scientific community without scientific publications and articles. We even find it unnecessary to talk about scientometric coefficients and factors. In this article, we attempt to address only the historical path of the publication of scientific journals and articles, which eventually led to a situation in which the entire scientific community, regardless of their attitude towards Scientometrics, accepted and adopted the crucial role and importance of scientific articles as a digital measurement tool of scientific activities. If anyone is interested in the historical evolution of the issue of measurability of scientific publications, there is an interesting article about it (Gevorgyan, 2017 pp. 6-10). We will restrict ourselves to a historical review of scientific journal publications.

Since the invention of the alphabet, humankind has tried to write down and provide generations with a description of each specific theoretical and practical achievement. Traditionally, however, it was done in the form of a theoretical monograph, where the author put his thoughts and discoveries into one summary and submitted it to the public. Nevertheless, the invention of printing changed the situation a little. The history of journalism informs that since the beginning of the 17th century, there was a particular public demand for regular access to information. It is not surprising, then, that one of the wisest men of his time, Duke of Richelieu (Cardinal Richelieu), was among the first to publish a print periodical. And it is not a coincidence that one of the most famous expressions - “he who owns the information owns the world”, is attributed to him (other than Richelieu, this idea is also attributed to a number of other notable people of different times and fields: Bacon, Churchill, Rothschild). It is Richelieu’s sponsor, Théophraste Renaudot, who is considered to be the founder of contemporary journalism. How-

ever, we are not interested in his “La Gazette”, published since May 30, 1631, and not even “Bureau d’adresse et de rencontre” (the Bureau of Meetings and Addresses) founded in 1629, which resulted in “Feuille du Bureau d’adresse” (“Address List”) published since 1632 (Tarakanova, 2011, p. 15).

We are first of all interested in his idea of publishing scientific journals, which was realized by his followers after his death. More specifically, Danny de Salo, a prominent scholar, writer, and public figure, under the direct support of Jean-Baptiste Colbert, began publishing the “Journal des sjevans” on January 5, 1665 (“Journal des savants” – “Scientists’ Journal” since 1816). This journal is officially considered the first science-oriented journal. The English magazine “Philosophical Transactions of the Royal Society” starts its publication on March 6, the same year. These two journals are currently disputing the title of the oldest scientific journal. Although the “Journal des Savants” was published a few months earlier, the “Philosophical Transactions of the Royal Society” is issued without interruption.

The publication of journals having similar content within the same period and in societies competing in various aspects suggests that scientific journals’ importance and role were recognized both in England and France. In addition, it is worth mentioning that still in 1663, the prominent French historian François Mezere received permission from Louis XIV to publish a literary journal, the publication of “Journal des savants”, however, thwarted his plans. Given the significance of the issue, we consider it essential to quote the text of the permission in its entirety.

“Our historian, Mr Mezere, has informed us that according to his 25 years of historical experience, one of the major functions of history is to highlight new achievements in science and art, since the knowledge about them is no less important to society than political and military news. Considering the importance of presenting

not only true and useful but also fun and entertaining information to his readers, he has decided to publish a weekly journal called “Literary Journal”. Considering that science and art display the power of the state no less than weapons and that bravery and spirituality are equally typical of the French nation, we further allow Mr Mezere to accumulate new discoveries and knowledge from all possible sources that will arise in Physics, Mathematics, Astronomy, Medicine, Anatomy and Surgery, Pharmacology and Chemistry, Arts, Architecture, Navigation, Agriculture, production of all kinds of valuable goods, that is, in all sciences, both in the humanities and in the technical fields, as well as in all branches of the Arts” (quoted according to Rykov & Polyakov, 2014, p. 8).

This piece perfectly illustrates the social preferences and the level of significance that existed among the enlightened circles of French society in the early 17th century. Obviously, had there not been a keen interest in scientific and artistic innovations in society, Mezere would hardly have persuaded Louis XIV. Even more, today, we would not have this kind of permission that is apparently full of excitement and expectations of success. From this, we can boldly conclude that the publication of a scientific journal in the early 17th century was a matter of public agenda in France, and it was only necessary to specify who would succeed in doing it. And as time has shown, the publication of “Journal des sjevans” finally solved the priority issue.

In 1668, the “Giornale de’Letterati” began to be published in Italy, in 1682 - the “Acta Eruditorum” in Latin in Germany, in 1688 - “Monatsgesprache” in German. The following scientific journals date only to the 18th century: “Санкт-Петербургские ведомости” (“Saint-Peterburg’s bulletins”) starts to be published in Russia in 1728, “Diario de los literatos de España” in 1737, “American Magazine” in the USA in 1742, and “Magyar Museum” in Hungary, 1788 (Rykov & Polyakov, 2014, p. 8).

Social Scientific-Educational Needs and Priorities and Scientific Journals

According to F. H. Garrison, by the 19th century, the articles published in these journals primarily included book abstracts and news on science and culture, which interested a limited number of people. Garrison (1934) also states that although scientific journals began to gain wide popularity, only in the 19th century, in the 17th century, 50 journals had been already published in France, which led him to conclude that France was the leader and pioneer in publishing scientific journal across Europe.

“Azdarar”, the first Armenian-language periodical, which had an enlightening and scientifically widespread nature, was published in Madras in 1794-1796. The publication of “Azdarar” itself is a somewhat symbolic and significant example in the context of the history of scientific journals. Due to rather severe transformations in the life of the Indian-Armenian community in the late 18th century, “...the educated Armenians in Madras apply to the spiritual leader of Nor Jugha with the request of sending a scholar-priest to Madras. Mkrtich Archbishop calls (Harutyun) Shmavonyan back from the priory and sends him to India”. As of 16 October 1794, Shmavonyan started to publish “Azdarar” periodical, which, according to him, had two goals – “first, to enable Armenian intellectuals to publish their books and articles, and then to provide the society and the children of the nation with a reading material” (Kharatyan, Gevorgyan, & Mkhitarian, 2006). This quotation best describes it that the publication of a scientific journal was not an end in itself; instead, it was an imperative of the time that resulted from a quite serious public demand. The educated strata of the society, realizing the critical role of scientific, cultural and regular news in society's harmonious and comprehensive development, formulated its understandable and perceivable requirements; meanwhile, the enlightened and leading public figures fulfilled their mission of meeting these demands through

scientific publications.

Conclusion

Before the emergence of scientific journals, scholars could only learn about each other's views and research through books or personal letters. According to some experts, this form of sharing results of scientific research was more of a priority for scientific discoveries rather than being aimed at solving any other problem. At the same time, letters did not allow for the most significant possible number of interested audiences. On the other hand, scientific journals relatively ensured a possibly broader audience intending to disseminate and publicize scientific discoveries and revelations, thus assuring possible scientific discussions. In fact, scientific journals objectively became the most crucial incentive that had been so long needed for the establishment and further development of science as a public institution. Today, hardly any scholar, researcher, or just a person interested in science tries to deny the invaluable role and importance of scientific journals in the difficult task of establishment and existence of science.

In modern days, scientific journals have been given another critical mission - to ensure the problematic mission of verifying the effectiveness of the scientific activity. Today's leading scientometric databases - Web of Science, Scopus, Google Scholar, have made the issue of scientific journals more relevant to science within the context of the integration and systematization of the public institute. Following the links to articles published in scientific journals, analyzing and classifying them, these databases stimulate the historical mission of scientific journals to satisfy the given public demand.

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